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CHICAGO, MARCH, 1915

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WHAT THE CONVENTIONS SHOWED.

THE Minneapolis and Chicago conventions showed a great many things—as many, in fact, as you care, in your enthusiasm, to list. The one big fact that was pounded home, though, was the utter ridiculousness of the idea that the independents have lost any ground in the old fight. One is inclined to the belief that they have gained ground. Like the American Indian, who is popularly supposed to be "dying out," there are more of them today than there were when Columbus landed, and there are more independents now than there were at the very height of the historical Bell-Independent war.

It has always been a characteristic of independence that it thrives on opposition—at least in the telephone field. The very ferocity of the Bell antagonism to early independent progress was as oxygen to the flames. That the astute Bell minds realized this (though not so soon as they might have done) is apparent. The effort to close the damper or change the direction of the wind, so to speak, culminated in that famous Blackstone hotel meeting, at which the president of the Bell system gathered with the presidents and managers and directors of a number of large independent companies, and preached co-operation.

It is a known, though perhaps unpublished, fact that this meeting had the effect desired by the Bell agents. The independents, in the vernacular, lay down. Then ensued that period of years in which was born the widely circulated report that the independent movement had ceased to move; that the independent cause was dead. In that report itself the Bell proved it had accomplished with soft words what years of more forceful methods had failed to do.

There was nothing in this condition to provide nourishment for further independence, except the fact that not all independent operators were satisfied with their supposed state of innocuous desuetude. After a period of surprised silence, a few of these reactionists began feeling about for others of like mind. They had need to go cautiously, because no man could tell who might still be his friend and who might have been converted by implied promises into an enemy. But eventually a new association was formed, and evoluted into the Independent Telephone Association of America, now just through its second annual convention. This body was organized to represent, and does represent, a continuation of the old spirit of "chemically pure" independence. Practically its only departure, indeed, from the old idea of independent telephony, the idea that prevailed at the time of the Hon. Hugh Dougherty (1905 and earlier), is that an independent may connect its lines with Bell lines and

still remain independent. That phase of modern operating is by force of necessity; the people and the governing bodies (new since the days of the cry of "traitor") insist on interrelation whether the operators will or no.

That opposition only encourages independence, we have already seen. That the subtler methods and soothing, rather than irritating, ways of diplomacy should have the same effect is a little surprising—though explained easily enough by analysis. The new association grew, and continues to grow, because it afforded an outlet for the large amount of radically independent spirit that persisted in spite of all interested efforts to prove it futile. The old association continued to grow—we make no apology for the statement—largely because of the return of confidence and the reawakening of interest and the spur of competition occasioned by the success of the new association.

Hard-headed and practical as we may be, we cannot deny that there is a certain inspirational impetus, a most persistent vitality that ordinary rules of business will not explain, about movements like that of independent telephony. Take the example of a certain independent manufacturer whose plant and good will, through trickery, became Bell property during the old warring days. By the time the courts had handed the property back to the independents it seemingly should have been a mere shell, with all its good will and going business sacrificed to the fortunes of war. That no such catastrophe occurred, and that the factory's business continued to increase by leaps and bounds, is common knowledge. "You can't beat the independents" ought to be, if it is not, a proverb of telephone history.

The fact that the combined attendance at the two independent conventions just held at Minneapolis and Chicago, with little duplication, was upwards of a thousand, ought to be sufficient evidence that the independent movement is still the most interesting and most virile feature of American telephone business. And that fact is further driven home by the one thousand there, making hundred-per-cent-efficiency conventions of both. By that we mean that every feature that makes a convention live up to its ideal purpose was carried through.

The conventions showed many things, but this, we believe, is the greatest of them all.

GETTING THE ASSOCIATIONS TOGETHER.

IN his annual address, printed elsewhere in this book, retiring President Hunter of the National Association, urges that efforts to get the two independent associations together be continued. He points out the obvious fact that even so strong a cause as that of independent telephony should not be divided. He implies further, that the divisional line between the two organizations is so narrow as to be almost invisible. With the first of these pleas we have always been in sympathy. Of the correctness of the second we are beginning to have grave doubts.

Naturally a difference of opinion existed or the new association would never have been formed. The old association members, possessing the original opinion and being satisfied with it, believe the difference to be inconsequential. The new association members, having fathered the new opinion, believe it to be all-important—which any opinion may excusably be to him who holds it. If we struck an average, a mean ground between these two sets of beliefs, we would still be far from a consolidation. Split the distance to infinity in half, and it is still a long way to Tipperary.

We do not want to be responsible, in that statement, for any impression that the two associations are actually irreconcilable. It is quite true that their points of difference are about as evident to the layman as the dissimilarity between, let us say, a Baptist and a Methodist. To the non-sectarian the distinction is readily reasoned away. To the orthodox member of at least one of the sects it is an unspannable gulf. The impression persists that they could get together if they really wanted to do so.

But any set of opinions as forcefully demonstrated, as productive of results, as generally effective as those which led to the organization of the Independent Telephone Association of America, are surely deserving of the utmost respect and consideration. We can say so much without presuming to attempt any comparative analysis or "deadly parallel" between the ideals that the two associations "stand for." We doubt if such an analysis could be prepared in good faith without tending to widen rather than narrow the breach.

We honestly wish we could offer some solution of the problem for the benefit of the independent cause at large. It has frequently had our editorial attention; but it must be confessed that on such occasions we succeeded only in voicing a few platitudes and some philosophy. Hesitating to inflict any more of that easily written but generally futile sort of dissertation on our readers, we are forced to find a new angle from which to view the situation.

There is one salient but rather unpleasant phase of the matter which is bound to be considered in conference, and which, therefore, we consider not injudicious in print. The manufacturers of independent equipment contribute very largely to the upkeep of both associations. These same manufacturers are quite out of sympathy with the idea of two associations. It does not require great astuteness to see that they could, by a simple and perhaps ruthless process, force upon the associations' directors a more kindly attitude toward amalgamation. The temptation no doubt is great, especially around convention time; but we trust the power will never be exercised. One reason for this hope lies in that respect we have already mentioned for opinions that have demonstrated their constructive value. Another reason is that such action would assuredly have a discouraging effect upon many telephone operators whose enthusiasm is necessary to the cause. The manufacturers should interfere only diplomatically, if at all, in the discussion.

The manufacturer is the chief protestant against the two-organization condition. Considering him as willing to waive his objections for the moment; suppose the two associations continue in the field, each loyal to its own brand of independence. Wherein will the cause be damaged by the division of force.

The only serious situation would be when association representatives had to meet representatives of the public—legislators and governing bodies. In such cases—which really constitute one of the important functions of associations—it is imperative that the whole independent field be represented. The same condition might be held to apply to official meetings with Bell representatives for the discussion of interconnection and toll distribution contracts. But it must

be remembered that each individual company must make its own final arrangement of this kind. Few operators, indeed, are willing to delegate to an association committee the power to sign their contracts. Legislators and regulating bodies, on the other hand, lay down their rules without asking anyone's permission, and with them an association committee can deal far better than can any individual.

The two associations, in spite of their differences, both recognize the importance of preserving intact the full independent strength. On such matters as demand the exertion of that full strength there is no good reason why they cannot co-operate. When the makers of regulation (who cannot be expected to know all about everything) extend a conference invitation to only one association, that body should deem it the part of courtesy and good independent enterprise to notify the other association. Every quasi-public conference, every event demanding the attention of independent telephone representatives, should be attended by a committee from each association, or a joint committee from both.

That one simple form of procedure at once lifts the curse from the dual association condition and gives the independents all the necessary features of a single organization. And at the same time the respective members of the two bodies may, if they insist, retain all the privileges of their convictions.

We merely want to point out to those who regard two associations as an unmitigated evil that with a little judicious co-operation even the objectionable points of that condition may be overcome, and that without sacrificing any set opinions. We all hope some solution may suddenly appear which will enable an actual combination of the associations; but the situation is not desperate if no such event transpires.

REGULATION OR STRANGULATION?

AN Ohio public utilities commissioner recently declared that legislation is making strangulation of regulation. This gloomy view of the situation was occasioned by contemplation of the state utilities law which forces an appraisal of all of the 1,500 or more public service companies coming under the jurisdiction of the commission. Here, he says, is an enormous economic waste. Thousands of dollars must be expended by many utilities which may never have a rate controversy before the commission, expended in buying appraisals for which they have no present or future use.

We have always considered the Ohio general appraisal law a little arbitrary, because there was no existing necessity for it, and no specific purpose behind it. As far as the theory of the action goes, we must agree with the dissenting commissioner. It will have to be admitted, of course, that an appraisal of your property is a good thing to have around the office, because it is just as well to be informed as to the exact value of your possessions. It might even transpire that with such a compilation before you, certain discrepancies and inadequacies in your rates would reveal themselves which would otherwise remain obscure until they had caused an unwieldy deficit. Thus the company which, in the words of the commissioner, would "never have a rate controversy before the commission" might suddenly find such a controversy highly desirable, and indeed, necessary. The appraisal itself, in short, might lead to rate corrections. And since the cost of such appraisal must obviously be included in legitimate expenses, to be met out of the rate schedule (and so paid for by the public) there is little direct cause to protest the order on the grounds of cost.

The real objection to the order, and to similar methods of regulation, is their psychological effect upon the incentive to organize and conduct public utility companies. However altruistic the performance of a public utility, the only sane reason for its operation is profits. It is true that those profits, under regulation, may consist of only a "reasonable return"; but that return must compete with the returns guaranteed by other investments open to capital, and the executive heads of such companies must be guaranteed salaries equal to those which would result from a similar display of enterprise and application in other fields. To hamper and confuse the work of public utility men by unnecessarily complicating their duties is to discourage the development of efficient service and so eventually embarrass and inconvenience the public.

That is what the commissioner meant by "strangulation." We do not believe the comparatively new work of regulating public utilities is in any serious danger from this source. We believe its operations, already more efficient than we might have expected, will improve with experience. At the same time, we believe public utility commissioners should approach their tasks with due humility, a proper sense of their great responsibility, and a realization of the vast amount that is yet to be learned about regulation.

THE LINCOLN HIGHWAY.

AN ocean-to-ocean highway means a great deal to the commercial life of this country. A few years ago it might have meant little; but in this day of almost universal use of the motor car, it is a matter of importance to all of us. The Lincoln highway is such a project.

Interconnecting roads by which one could journey across the continent have long existed. The Lincoln highway is not a new road; it is a process of connecting present roads and so marking the whole route that the traveler will have no trouble in following it. It is evident then that the method of marking is the most important feature of the plan.

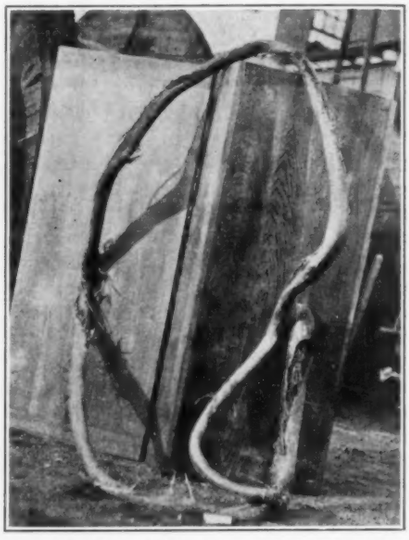
Every through road has its line of telephone poles. These poles afford the most available and the most desirable locations for signs or marks indicating the continuation of the highway. The Lincoln highway commissioners want to use them for that purpose. There is no good reason why telephone companies should not accede cheerfully to the request, and a good many reasons why they should.

Some operating companies have rules against the use of their poles for signs. Every good rule has its exception, and the Lincoln highway is the exception in this case. It will do the poles and the company no harm, and will do the whole country considerable good.

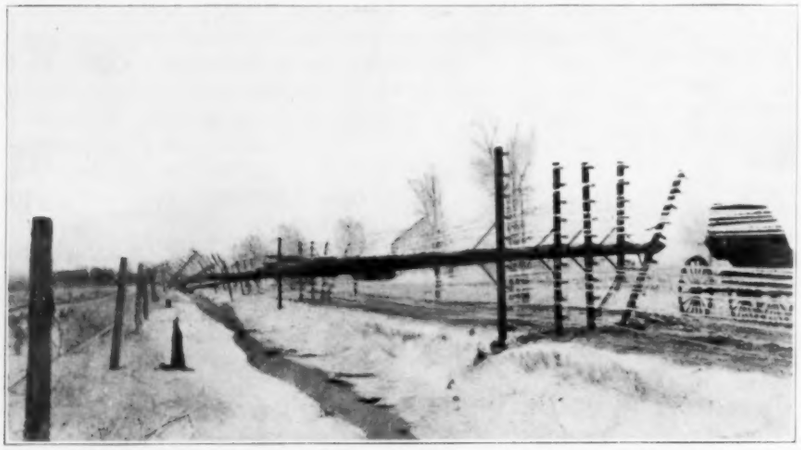
Let the Lincoln Highway Commission put its marks on your poles.

At Fort Lee, N. J., a 300-pair 22-gauge aerial cable recently had to be lowered to the ground to permit the passage of a house being moved to a new location. The work of lowering the cable necessitated the use of block and tackle, as shown in the center illustration. The first picture shows the house part way over the cable. The third picture shows house at new location, cable back in position, and twisted pair loop from pole to house where telephone is installed.—Telephone Review.

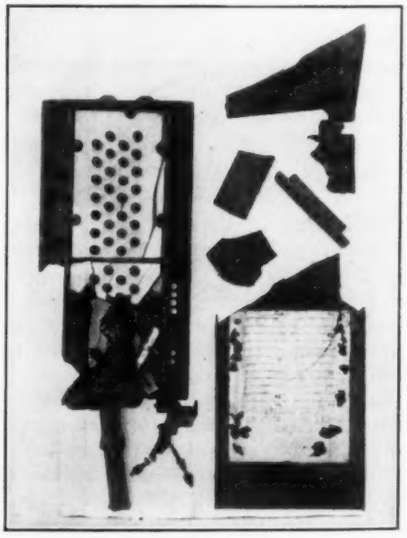
Mayor Curley of Boston Talking to Mayor Rolfe of San Francisco Over the Transcontinental Line. This greeting was a Part of the Celebration Attending the Opening of the Cross Continent "Voice Highway" on January 25, in Which Many Famous and Notable Men Participated.



A telephone cable after contact with a trolley wire at Wellston, Mo. The cable sheath burned through spirally, following the twist of the wire in the cable. Approximately 240 feet of cable were burned.—Southwestern Telephone News.



Typical Sleet Storm Destruction of Telephone Pole Lines, as Seen in Iowa Within the Last Week.



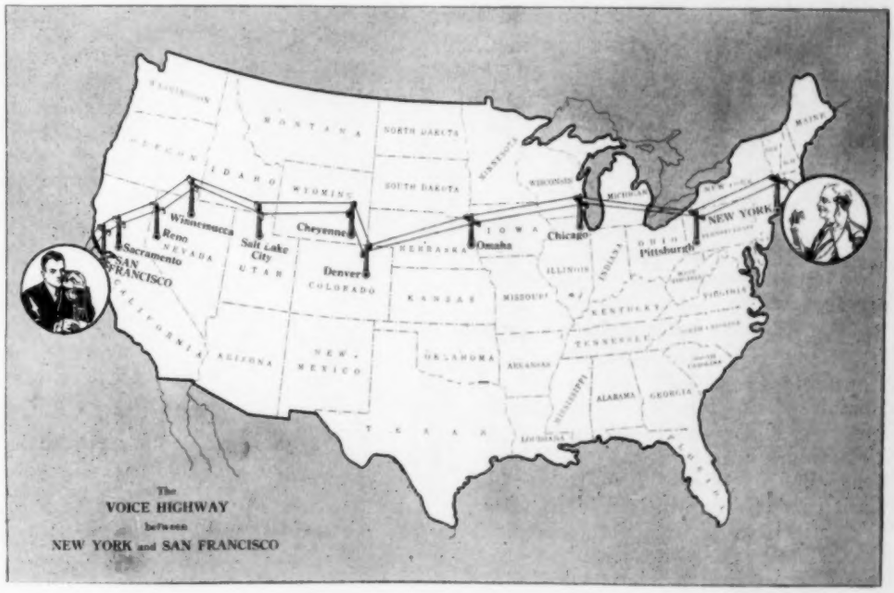
A 26 pair No. 14 terminal, blown up by lightning. The cable was grounded. The only open wire was two spans long, the rest being twisted pairs.—Southwestern Telephone News.

STORIES IN PICTURES OF TELEPHONE PRACTICE AND PROGRESS IN ALL PARTS OF THE WORLD.

Germans Repairing a Telephone Line Destroyed by the Russians to Prevent Its Use. Photos Copyright by New York Times.

Germans Using a Portable, Telescopic Telephone Pole in the Field. Note the Apparatus for Raising the Pole.

The Lightest Type of German Portable Field Telephone. The Wire Is Carried on a Hand Reel and Pays Out as the Soldier Walks Along.



Courtesy of the Western Electric Company.

STORIES IN PICTURES OF TELEPHONE PRACTICE AND PROGRESS IN ALL PARTS OF THE WORLD.

Notes of the Independent Telephone Association

NATIONAL JOINT COMMITTEE ON LINE CONSTRUCTION.

B. G. Hubbell, president of the Federal Telephone and Telegraph Company, Buffalo, New York, has been appointed to represent the Independent Telephone Association of America on the National Joint Committee on Overhead and Underground Line Construction. The reports and conclusions of this committee will be published from time to time.

SAN FRANCISCO CONVENTION.

Subsequent to the action of the convention at Minneapolis recommending that a convention be held during 1915 at San Francisco in connection with the Panama Exposition, the board of directors has appointed a committee on arrangements consisting of W. S. Vivian, Chicago; W. H. Bryant, Mobile, Alabama; H. L. Beyer, Grinnell, Iowa.

The convention will start on Monday, October 25. A special train is being arranged which will probably leave Chicago on Thursday night, October 21. Full announcements as to transportation arrangements and hotel accommodations will be made within a few days.

DATE OF ANNUAL CONVENTION.

It has been suggested that better results would be had if the annual conventions were held during the summer months rather than in the winter. Let the association have your views on this.

ANNUAL MEETING.

At the annual meeting on Tuesday, February 9, the action of the convention in electing officers and directors was ratified. They are as follows:

E. B. Fisher, president, Grand Rapids, Mich.; E. D. Schade, first vice-president, Johnstown, Pa.; W. H. Bryant, second vice-president, Mobile, Ala.; R. Valentine, treasurer, Janesville, Wis. Directors: B. G. Hubbell, Buffalo, N. Y.; W. J. Uhl, Logansport, Ind.; J. C. Casler, Dallas, Texas; J. H. Wright, Jamestown, N. Y.; Samuel Hill, Portland, Ore.; H. L. Beyer, Grinnell, Iowa; T. J. Shufflin, Butler, Pa.; L. A. Herrick, Freeport, Ill.; H. L. Reber, St. Louis, Mo.; E. M. Prisk, Hazleton, Pa.; G. W. Robinson, St. Paul, Minn.

ACCOUNTING CONFERENCE.

H. Linton Reber, vice-president and general manager of the Kinloch Long Distance Telephone Company of Missouri, St. Louis, Mo., has been appointed representative of the Association at the accounting conference called by the Interstate Commerce Commission, which convenes in Washington, March 4.

CONVENTION PROCEEDINGS.

The 1915 Convention Proceedings will be ready for distribution within a few days. Send for a copy. They are free.

STANDARDIZATION COMMITTEE.

Four of the seven members of the Standardization Committee have been appointed. They are: A. J. Shands of the Kinloch Telephone Company, St. Louis, Mo.; A. J. Seymour, engineer, Tri-State Telephone & Telegraph Company, St. Paul, Minnesota; J. M. Storkerson, superintendent, La Crosse Telephone Company, La Crosse, Wisconsin; W. H. Hay, service engineer, Western Pennsylvania Independent Telephone Association, Pittsburgh, Pennsylvania.

Three other members will be appointed as soon as possible, and a meeting of this committee will be called.

FINANCIAL ORGANIZATION.

At the Minneapolis convention H. L. Beyer and W. S. Vivian were appointed as a commmittee to co-operate with J. C. Kelsey and H. H. Knipe, to perfect a financial organization, whose mission, in part, would be to bring companies who need money to develop their business into touch with those who have the money.

OPERATING RULES.

The Association carries in stock Operating Rules covering magneto, common battery and long distance work. These are for sale at twenty-five cents per copy to member companies and fifty cents to others. Every operator should be furnished with a copy.

SHIELD PINS.

Since one of the Pennsylvania chief operators inquired about getting shield pins that operators and others could wear, 1,250 have been sold and another order has been sent in for five hundred more. The Association will sell them at cost, which is fifteen cents each.

Wisconsin State Telephone Convention

February 10, 11 and 12 were the dates of the Wisconsin State Telephone Association convention held at the Park Hotel, Madison.

Manufacturers and supply dealers occupied the entire second floor and exhibited every telephone device of interest to those attending.

The secretary's report was read, showing the association to be in excellent financial condition.

Vital subjects were discussed, including addresses and papers on "State and Interstate Accounting," by G. C. Mathews; "Workmen's Compensation," by Charles H. Crownhart; "Legislation," by J. C. Gaveney; "Value of Maintenance of Lines and Equipment," by W. S. Pedley; "Preservation of Poles and Cross Arms," by C. H. Teesdale; "The Lines of Force," by Prof. B. W. Snow.

Before adjourning, it was proposed that the dues of the association be reduced from $10 to $5 per year.

Light on the Cook Patent Situation

Negotiations which have been pending for a long time between Frank B. Cook of Chicago, and various interests which have controlled the Sterling Electric and subsequent companies, at LaFayette, Ind., were concluded a few days ago, whereby Mr. Cook has acquired all their patents, including protector and terminal patents, also all their special tools, drawings and specifications, as well as entire stock on hand, and parts of protectors, terminals and distributing frames of all kinds.

By this arrangement, Frank B. Cook acquires full possession and will, within a short time, be ready to supply Sterling parts.

By this deal, Frank B. Cook not only acquires a number of additional patents, but also clears up what might under certain contingencies, be set up as a cloud to the clear title of a few of his patents, and he now proposes to prevent infringement of his patents. He claims a self-soldering protector recently placed on the market infringes no less than twelve of his patents and that a number of other articles of competitive manufacture are likewise infringements.

Oregon Organizes Telephone Association

Representatives of fifteen independent telephone companies in Oregon held a meeting at Salem and elected the following officers: Charles E. Wells, president; C. B. Sundberg, vice-president; P. L. Brown, treasurer. It is expected that the next meeting will be held in Portland.

National Convention Biggest in History

Report of the National Independent Telephone Association's Eighteenth Annual Meeting at Chicago

WHAT was affirmed to be the biggest convention, in point of attendance, ever held by the association was the eighteenth annual event of the National Independent Telephone Association at Hotel La Salle, Chicago, February 3, 4 and 5. The register, which we reproduce on other pages, shows a total of over 600 names, and nearly two-thirds of these were present at the opening session. That the independents have wholly "come back"—if, as has been alleged, they were ever "out"—cannot be doubted by anyone who attended either of the two recent conventions.

President C. Y. McVey.

At approximately ten-thirty Wednesday morning, February 3, President N. G. Hunter called the opening session to order. Edward E. Gore welcomed the delegates to the city on behalf of the Chicago Association of Commerce. In response S. G. McMeen, president of the Ohio State Telephone Company, praised the telephone business for its remarkable growth and speed. The outlook for the business, he said, was never so good as it is now.

Judge Hunter then delivered his annual presidential address, which is printed on another page of this issue. It will be noted that he urged the amalgamation of the two associations for the good of the cause. Manford Savage of Champaign, Ill., an ex-president of the association, moved that the president's address be printed in pamphlet form and that the convention extend the speaker a rising vote of thanks, which motion was unanimously carried.

Amendments to the by-laws, adopted by the directors February 2, were submitted to the convention for ratification by Secretary F. B. MacKinnon in the following order:

1. That Section 4 of Article 7 be amended to read as follows:

No initiatory membership fee shall be required, but it shall be a condition of membership that each year any company desiring membership shall pay in advance to the treasurer annual dues in the sum of $1, and the payment of such dues shall entitle the company so paying (provided it shall have been admitted to membership by the board of directors) to all rights and privileges conferred by these by-laws upon members during the fiscal year of the association for which such payment shall have been made.

Provided, further, that each such company shall designate the association as its legal representative before the Interstate Commerce Commission at Washington.

2. That Section 3, Article 6, shall be amended by adding these words:

Presidents of state associations shall be ex-officio honorary vice-presidents of this association, providing that each of said presidents of state associations shall be eligible to membership, as provided in Section 1 of Article 7 of these by-laws.

The polls shall be open at 3 p. m. and close at 6:30 p. m. of said day.

Secretary F. B. MacKinnon.

3. Section 8 of Article 5 shall be amended as follows:

A question arising as to eligibility to vote, Secretary MacKinnon explained that the by-laws were prepared in anticipation of a convention during each fiscal year, but the board of directors postponed it to the first part of the succeeding year. A. F. Adams, Kansas City, Mo., moved the adoption of the amendments, with the proviso that all companies with dues paid for 1914 be eligible to vote. C. Y. McVey seconded the motion and it was carried. Manford Savage moved that the rules be suspended and all delegates of member companies be allowed to vote for the nominating and resolutions committee, as the credentials committee had not time to prepare a report of the list of members, which motion was carried. A total membership of 400 companies was reported.

President Hunter announced the following committee appointments:

Committee on Credentials—F. L. Beam, Mt. Vernon, Ohio; E. C. Blomeyer, Waco, Texas; A. S. Hall, Redfield, S. D., appointed.

Nominating Committee—Gansey R. Johnston, Columbus, Ohio; W. Roy McCanne, Rochester, N. Y.; Samuel W. Harper, Pittsburgh, Pa.; A. F. Adams, Kansas City, Mo.; W. N. McAnge, Jr., Corinth, Miss., elected.

Committee on Resolutions—Manford Savage, Champaign, Ill.; S. G. McMeen, Columbus, Ohio; H. B. McNeal, Chicago; J. B. Earle, Waco, Texas, and Honck McHenry, Jefferson City, Mo., elected.

The secretary made a few announcements and the first session was adjourned.

WEDNESDAY AFTERNOON SESSION.

"Catch My Pal" Patterson, a noted Presbyterian minister, who is doing some remarkable mission work among Chicago's "submerged tenth," entertained the meeting for over half an hour. He made an interesting point of the fact that in the old days business deals were generally sealed with a round of drinks, or several rounds; the telephone has done away largely with this condition.

Francis Dagger, electrical and telephone expert of the Ontario Railway and Municipal Board at Toronto, Canada, read a very interesting paper on "The Results of Government Ownership of Telephone Systems of Canada." He congratulated the independents of the United States on overcoming monopoly, and ascribed the same motives to the independent movement in Canada. Government ownership in Canada, which grew out of the same

Eighteenth Annual Banquet of the National Independent Telephone Association, Hotel La Salle, Chicago, February 4, 1915.

dissatisfaction with monopoly, is confined to the three western provinces of Manitoba, Saskatchewan and Alberta, and in Saskatchewan only 5 out of 300 telephone systems are government owned, while in Manitoba the government has 7 out of 34. These three provinces had a population of 600,000, served by 7,000 Bell telephones (4,000 of which were in one city—Winnipeg) when government ownership was first agitated. The speaker claimed that the government systems have been successful, and have increased the number of telephones to practically 100,000.

H. B. Shoemaker, Toledo, Iowa, of the Commercial Telephone Company, read a paper on "The Iowa Idea, or the Spirit of Service as Applied by the Iowa Association." He spoke of the operating school conducted by the Iowa Association, with Miss Gang as teacher, modeled after the schools conducted by W. S. Vivian, now secretary of the Independent Telephone Association of America. The Iowa Association is also co-operating with the Iowa State College at Ames in preparing telephone short courses. It is also working, besides its operating school, along the lines of schools for plant men, a technical service bureau and a series of bulletins on telephone problems, including accounting. Mr. Shoemaker closed with an announcement of and invitation to the Iowa independent telephone convention at Des Moines, March 9, 10 and 11.

Gansey R. Johnston, vice-president of the Ohio State Telephone Company at Columbus, spoke upon "The Individuality of the Operator." He emphasized his belief in the discretion, trustworthiness and competence of the operators in dealing with the public, handling its emergency demands and keeping its secrets. The operator, he said, requires less supervision than any other kind of employe, and paid high tribute to her general loyalty, resourcefulness and efficiency, urging that managers and chief operators give her more interest and appreciation.

After a report by Chairman F. L. Beam of the credentials committee and some announcements by the secretary, the second session was adjourned.

THURSDAY MORNING SESSION.

Thursday morning's session was an engineer's meeting, J. C. Kelsey being chairman of the division. The attendance was the best ever enjoyed by the technical conference, and the interest most keen. Mr. Kelsey's paper on "Intangible Values" opened the discussion. He showed graphically the cause of the well-known deficit which usually must be charged up to the cost of experience. Permission by the rate-making bodies to capitalize this deficit was the point discussed. Kempster B. Miller thought it was a part of the going value. Frank A. Davis called it the "establishment of trade account." Mr. Doty, of the Ohio Commission, pointed the necessity for a method of proportioning rates to efficiency of service. Capital and brains are two factors that must be considered in public utility work, and "reasonable return" should be made on real value. "Cost of ignorance" should not be capitalized.

Kempster B. Miller addressed the meeting on "Valuation of Physical Properties." He pointed to the general confusion of the terms "cost" and "value." While courts, commissions, engineers and laymen use the two words synonymously, they have obviously a widely different meaning, and are likely to coincide only when read upon the same date. He preferred the term "collateral cost" to "overhead" and "indirect" cost. Mr. Miller's address will be published later.

In another room a session on accounting was in progress, presided over by LeRoy Parker, general auditor of the Ohio State Telephone Company. C. A. Bennett, general auditor of the Kansas City (Mo.) Home Telephone Company, spoke on "The Accounts as Prescribed by the Interstate Commerce Commission for Class C Companies," showing charts of the forms used. The question of discounts on telephone bills was answered by John W. Van Sant of the Interstate Commerce Commission, who explained that such discounts should not be charged to revenue account. Actual depreciation, said Mr. Bennett, could be determined only by inspection and not by age alone. Telephone companies should be prepared to furnish appraisals of their properties to the commission, as some time they will be called for.

John W. Van Sant of the commission explained the work of that body, and its willingness to answer questions. A question often asked is the proper distribution of time where one man does several kinds of work, and he said the companies' judgment in each case was the only rule. December 31 was selected by the commission as the best for closing books, as little construction is being done then, and he thought the state commissions having different dates will eventually change their rules. He believed the Interstate Commerce Commission would be lenient for the first year in regard to the accounting system recently prescribed for Class C companies, until they become adjusted to the new system.

Following Mr. Van Sant's talk, adjournment was taken.

THURSDAY AFTERNOON SESSION.

The first business of the Thursday afternoon session was the report of the nominating committee, which was read by the secretary. The report presented 21 names for nominees for directors. The president announced that the 17 receiving the most votes, according to the by-laws, would be elected, and invited nominations from the floor, which added two more names. As a committee on election, O. O. Welshheimer, Ohio; H. C. Todd, Missouri; C. A. Shock, Texas, and C. C. Deering, Iowa, were appointed as judges, and F. V. Newman, Michigan, and H. H. Knipe, Illinois, as clerks. Chairman Beam of the credentials committee reported an accredited delegate list of 180 votes.

Secretary MacKinnon presented informally a report of the conference committee on the Bell qualified toll contract, using a chart to clarify the terms of the contract. The same subject was treated by the president in his address, which is printed elsewhere.

Richard Yates of the Illinois Public Utility Commission spoke next on "The Telephone Problem." That commission, he said, had acted on 1,064 cases, of which but 22 had been appealed, and in 12 such appeals the courts upheld the commission. Telephone companies to the number of 793 reported to the commission, and the total capitalization of such companies in the state, exclusive of the American Telephone and Telegraph Company, is $77,430,000. There are 1,302 exchanges in the state, and 130 mutual companies which do not report. He opposed municipal ownership, as well as municipal regulation. It is the policy of the commission to permit but one company in a town where service and rates are right. Fairness by all sides, he said, would solve the telephone problem.

E. M. Doty of the Ohio Commission spoke on "Valuation of Telephone Properties." He cited the danger of over-regulation and favored municipal ownership under different economic conditions from those obtaining; but

that there was no danger from that source so long as service and rates of private companies were reasonable. The average company, he said, did not know what it owned until the commission required an appraisal. Ohio public utilities paid $18,890,000 in taxes last year; and he suggested that telephone companies in rendering their bills designate a part of the charges as taxes.

Chairman McIntyre of the Ontario Railway Commission delivered a greeting from Canadian telephone men to the convention.

THE BANQUET.

Over three hundred attended the annual banquet Thursday evening, February 4. Cabaret entertainment was provided, including exhibition dancing, monologues, feats of magic and singing. No speaking was done.

FRIDAY MORNING SESSION.

The accounting and engineering conferences of Friday morning were held together. W. F. Sloan, Madison, Wis., opened the session with a paper on "Unit Costs," which will be abstracted in a later issue. R. V. Achatz, instructor in telephone engineering at Purdue University, gave his views of the trend of prices of material, agreeing with Mr. Sloan that this factor should be considered.

E. C. Hurd, Lincoln, Neb., talked on "Depreciation" in a very interesting manner.

R. E. McDonald, Kansas City, Mo., discussed appraisals, urging that the information obtained from them be used to enlighten the public before they fell into misuse by political interests.

The report of the election committee showed the following directors to have been elected:

Terry W. Allen, Jackson, Tenn.; S. G. McMeen, Columbus, Ohio.; W. Roy McCanne, Rochester, N. Y.; C. Y. McVey, Cleveland, Ohio; N. G. Hunter, Wabash, Ind.; W. C. Handlan, Wheeling, W. Va.; J. B. Earle, Waco, Texas; P. C. Holdoegel, Rockwell City, Iowa; F. B. MacKinnon, Washington, D. C.; H. D. Critchfield, Chicago, Ill.; A. F. Adams, Kansas City, Mo.; C. E. Tarte, Grand Rapids, Mich.; A. G. Bean, Elyria, Ohio; L. D. Kellogg, Chicago, Ill.; H. B. McNeal, Chicago, Ill.; L. E. Hurtz, Lincoln, Neb.; S. W. Harper, Pittsburgh, Pa.

This board of directors elected officers as follows:

President, C. Y. McVey; vice-president, Terry W. Allen; secretary-treasurer, F. B. MacKinnon.

The Executive Committee was made up of:

C. Y. McVey, chairman; F. B. MacKinnon, secretary; H. B. McMeal, Terry W. Allen, W. Roy McCanne.

The Finance Committee was reported as:

S. G. McMeen, chairman, N. G. Hunter, C. E. Tarte, L. D. Kellogg, A. F. Adams.

President McVey was accordingly installed and made a few appropriate remarks.

The report of the resolutions committee was then presented by its chairman, Manford Savage. These resolutions were adopted by the convention:

Resolved, That this convention again announces its firm conviction that the most efficient and satisfactory service to the people can be given by locally owned and oeprated companies connected up on equal terms with all toll lines under governmental and state regulation.

Resolved, That the underlying principle that should control all state or governmental regulation should be the giving of good service at the lowest rate consistent with furnishing a fair return upon all capital invested, and that unnecessary and technical and burdensome requirements calculated to support pet theories of government rather than to improve the furnishing of telephonic communication should not be enforced by any regulatory body.

Resolved, That in view of the enormous responsibility and powers imposed upon state public utilities commissioners and the effect that their actions have upon industries wherein the investments amount to many millions of dollars and upon the people who are the users of service furnished by the utilities and to the end that the greatest efficiency may be secured, this convention favors the amendment of all state laws so that public utility commissioners shall be elected for a term of ten years, with the further provision that no commissioner shall hold any other public office nor become a candidate therefor, during his term nor for two years after the expiration thereof.

Whereas, The Independent telephone companies of the United States are in need of funds to build up and extend their business to meet the ever growing demands, and

Whereas, There has not been heretofore any person or corporation in possession of any considerable funds that are giving special attention to securities of Independent companies, and

Whereas, gentlemen known to have given the greater part of their lives to the promotion of Independent telephone interests and who are worthy of the confidence of the people to handle such a proposition have undertaken to form an organization for the purpose above mentioned; therefore, be it

Resolved, That this association heartily approves of the organization of a telephone security corporation as proposed by reliable and responsible Independent telephone men.

Whereas, The immediate future bespeaks renewed prosperity for the Independent telephone business and the demands of the future looking to the legitimate extension of the business and the protection of the properties now in the Independent field are such as to demand the united efforts of all Independent telephone men in the United States; and

Whereas, We believe that there are no weighty reasons why all Independent interests should not and cannot be united; therefore be it

Resolved by this convention that the incoming board of directors be and they are hereby instructed to continue the committee heretofore appointed to meet with a like committee from the Independent Telephone Association of America to effect a consolidation upon fair and reasonable grounds of the two national associations.

Resolved, That the thanks of the convention are hereby extended to the management of the Hotel La Salle for the many courtesies extended the officers and members of this association.

Resolved, That the thanks of the convention are due to the retiring president, Judge N. G. Hunter, and the secretary, F. B. MacKinnon, and to the out-going board of directors for their unselfish and effective work for this association and the cause of Independent telephony during the past year.

Whereas, The Lincoln Highway Association is doing the pioneer work in arousing interstate interest in the completion of a good highway from the Atlantic to the Pacific ocean, and the proposed highway in many cases runs along public roads on the borders of which telephone companies have pole lines, and whereas it would greatly facilitate the work of the association to place markers on the poles of the telephone companies;

This association recommends that all Independent telephone companies permit markers to be placed on their poles to indicate the route of the great Lincoln highway.

Resolved, That the questions before the engineers program committee of a permanent engineering committee or division, and of a standardization committee of the association, be referred to the board of directors with the recommendation of the convention that action be taken according to the judgment of the board as to needs and methods.

John W. Van Sant of the Insurance Commerce Commission then explained that blanks for class A and B companies would be ready soon and their reports should be in by two months; companies of other classes to be notified when to send in reports. He said there were 50 class A companies, 200 class B, 2,000 class C, and about 8,000 others coming under interstate jurisdiction.

FRIDAY AFTERNOON SESSION.

The Friday afternoon session was given over to a continuation of the accounting discussion, in which was brought out some extremely interesting experiences, information and theory. When the subject and the delegates were exhausted the biggest convention ever held by the National Independent Telephone Association was declared adjourned.

Telephone Talks

The Third Installment of an Instructive Serial Course for all Telephone Workers

BY G. W. CUMMINGS AND ARTHUR KNEISEL*

THE meeting having been called to order and thrown open to discussion, the Installer promptly came to the front with this question, "What is the most important part of a telephone system?"

The President suggested: "That seems to me a good deal like asking which is the more important part of an automobile, the wheels or the engine. It couldn't run very far without either one, just as a telephone exchange could hardly give first-class service without a switchboard, lines, or instruments. On the whole, however, I think the instrument might properly be considered as the most fundamental, because all the rest of the plant really exists only for the purpose of connecting instruments together so that they can talk."

"All right," said the Installer, "what makes it talk?"

The President hesitated a moment: "Don't you think that is a rather large question? Taken literally, nobody knows. We can see, to some extent, why sending a current through a lamp heats the filament and gives us light, and by a little further stretch of the imagination, what makes a motor turn; but to talk at a piece of sheet aluminum and expect someone a thousand miles away to understand every word and even recognize your voice, that is something which only grows more wonderful and more mysterious as we study it. Suppose we ask the Tester to tell us something about it."

FIG 11

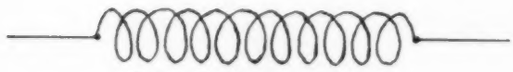


FIG 12 (ALSO FIG 17)

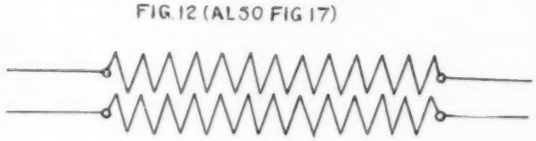


FIG 13

FIG 14

The Tester, like every other telephone man, thought in circuits; and so he immediately proceeded to draw an instrument circuit on the blackboard, and then started to trace it and explain its action.

This brought a protest from the Installer. "I know that that line represents a wire, and that zig-zag affair an induction coil, and so on, but what do they really mean? Is there some actual reason for drawing them just that particular way?"

The Draftsman, who was a quiet chap, full of odd ideas, jumped to his feet and was recognized by the chair. "There is a reason for every bit of that," he said, "and we cannot read a circuit intelligently until we understand those reasons. Did you ever stop to think what the common alphabet means and where it came from? The first attempt of man to convey an idea other than by means of speech or gestures was to draw a crude picture of it. The hieroglyph of ancient Egypt and modern China illustrates this stage. As civilization advanced these hieroglyphic alphabets became conventionalized into the present twenty-six letter system, which is adequate for most purposes. We combine the letters into words and the words into sentences and so convey the idea. But no system of simple conventions can ever cover all cases. Suppose you attempt to describe a relay or a cord circuit to a man who has never seen one. Unless he has a picture of some kind, either in his mind or on paper, all the words in the dictionary will never make it clear to him; and so we have to supplement the alphabet by going back to the original idea of picture writing. Looked at in that way, each symbol might be considered as a word; and just as the meaning of a sentence consists of the combined meanings of the various words which make it up, each word modifying and supplementing the others, so the meaning of a circuit

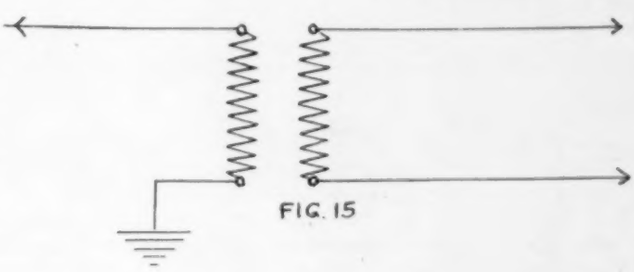


FIG. 15

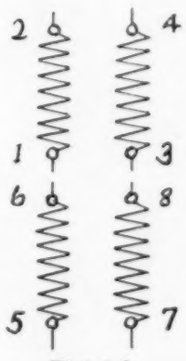


FIG. 16

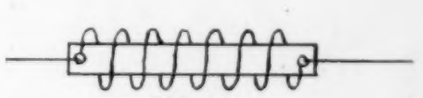


FIG. 18

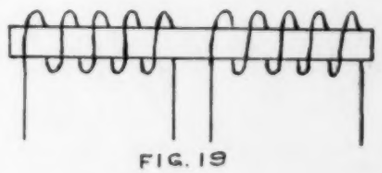


FIG. 19

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is simply the combined meanings of the various symbols which compose it, each modifying and interacting with the others. When you see a circuit shark in action you are sometimes tempted to think that he has some magical faculty that is beyond the ordinary mortal, but he hasn't; he is simply reading that circuit in the same way that you read a sentence."

"That sounds like Greek to me," was the some-

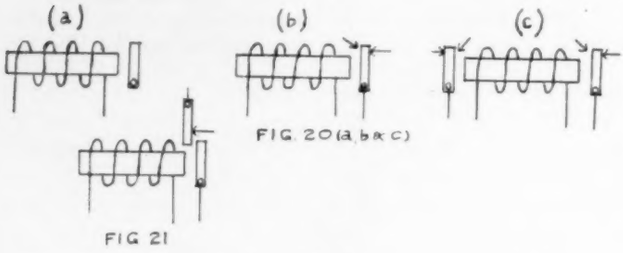


FIG. 20(a, b & c)

FIG. 21

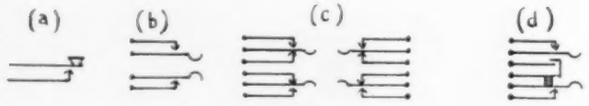


FIG. 22

what discouraged comment of the Installer. "It's as bad as learning a new language."

"That's precisely what it is," rejoined the Draftsman. "It is learning a new language, but with this difference, that instead of having to memorize a collection of apparently arbitrary words (and that is what learning another language means to most of us) all we have to do is to realize the fact that a drawing symbol is a picture of an idea. When we have once grasped that fact, the translating of the symbol into more familiar language becomes a simple matter."

The President broke in: "I don't believe we can spend our evening to better advantage than by learn-

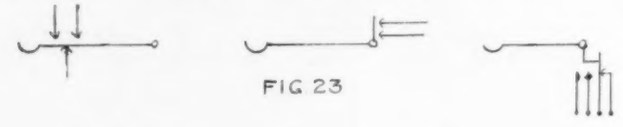


FIG. 23

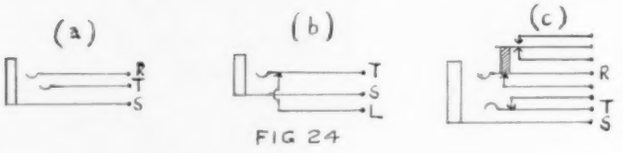


FIG. 24

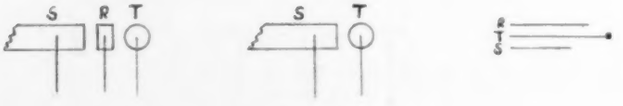


FIG. 25

ing the language of circuits, and I suggest that the Draftsman take the floor."

The blackboard was cleaned off and the Draftsman went to work. "As the Installer has said," he began, "a wire is represented by a line. Why? The whole idea of a wire is simply that it is something which carries a current from one point to another. As I draw this line on the blackboard what happens? Your eye naturally follows the chalk, and the line which results serves to carry your attention from one point to another. That is the whole purpose of the line in a drawing, to symbolize the path which the current follows. In tracing the circuit we follow the lines, and in that way find what path the current takes. This is, of course, the simplest symbol used, but the idea on which it is based appears in practically all symbols of this class; that is, all symbols which are pictures of ideas. There is another class which we will talk about later.

"Let us carry this method a little farther. Suppose we want to represent a resistance coil. The idea here is that of a considerable length of wire in a small space, and what more obvious way of showing it could be imagined than that of a zig-zag line?" (Fig. 11.)

The Installer crowded his way to the front and appropriated the chalk for a moment. "Why not draw it round and round, more as it is actually wound, like this?" he asked. (Fig. 12.)

"For two reasons," replied the Draftsman. "In the first place a simple resistance coil is not usually wound that way at all, but non-inductively. Besides, it brings in another idea which we will consider later. Figure 11 cannot possibly be made to convey any idea except that of simple resistance. Since it cannot

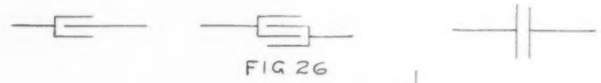


FIG. 26

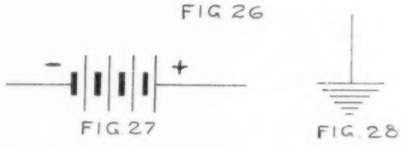


FIG. 27

FIG. 28

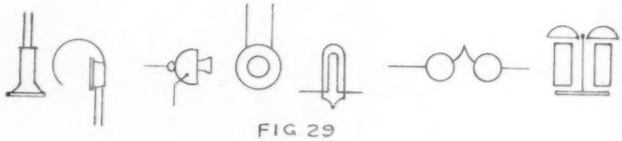


FIG. 29

be misunderstood and cannot be further simplified, I do not see how it can well be improved upon.

"So much for the resistance coil. Another piece of apparatus with which we have a good deal to do is the induction coil. As indicated by its name, this depends for its action on the fact that a varying current in one wire will induce corresponding variations in another wire parallel to it or wound around the same core. Essentially, then, an induction coil consists—except in special cases—of two separate windings, parallel and close to each other. I cannot think of a more obvious way to illustrate the idea than this." (Fig. 13.)

The Repairman spoke up. "A local battery coil usually has a good many more turns in the secondary than in the primary, while a common battery coil has a more even ratio. How would you show this difference?"

"That is a refinement which is not usually considered necessary," replied the Draftsman. "In cases where it is advisable to make the distinction in order to avoid confusion you can do it this way. (Fig. 14.) I do not think any one is likely to be in doubt as to which winding shown in this symbol has the larger number of turns."

"What is the difference between the symbol of an induction coil and that of a repeating coil?" asked the Switchboardman.

"If the repeating coil has only two windings it is, to all intents and purposes, an induction coil, and would be represented in the same way," was the answer. "If, for example, we want to show a grounded line connected to a metallic line through a repeating coil to avoid noise, we can do it in this way. (Fig. 15.)

"When a coil has four windings, such as those in common battery switchboard cord circuits, it is shown thus (Fig. 16), and the windings are connected together according to circuit requirements. It will be noted that the windings are grouped in pairs, windings *1-2* and *3-4* forming one pair and *5-6* and *7-8* the other, to indicate that the two windings in each pair act inductively on each other.

"A special case of the induction or repeating coil is where there is only one winding, and the inductive effect is between adjacent turns of the same wire. Such a coil offers a considerably greater impedance to a varying current than that due to its simple resistance,

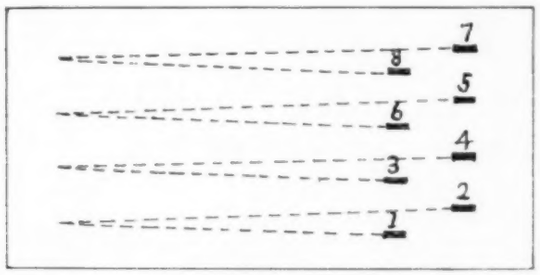


FIG 30

and also retards or chokes back the current. It is variously known as an impedance, retardation, inductance, or choke coil. Since the self-inductive effect can take place only when the turns are parallel, it is usually represented as a simple spiral winding (Fig. 17), where each turn is evidently parallel and close to the adjoining turns and will consequently affect them inductively.

"In practice, a retardation coil is usually wound on an iron core, which greatly increases the effect, and this core is often indicated by a long rectangle. (Fig. 18.) Retardation coils often have two windings, which are shown thus: (Fig. 19.) Care must be taken when using this diagram to see that the current is shown to be traveling around the core in the same direction—clockwise or counter-clockwise—in both windings, as otherwise a person reading the drawing would assume that the coil was connected non-inductively.

"One of the clearest and most interesting symbols is that of a relay. A relay consists first of a coil wound inductively around an iron core, and thus embodies the same idea as the simple retardation coil. (Fig. 18.) A current in passing through the winding will evidently magnetize the core, and if we mount near one end of the core an armature, pivoted at one end and free to move at the other, it will be attracted and will swing toward the core. (Fig. 20*a*.) If we arrange contacts so that they are opened or closed by this movement of the armature we have a relay which will open or close a second circuit in accordance with the current changes in the first. (Fig. 20*b*.) The position of the contact, in front or back of the armature, shows clearly whether it is closed or opened by the movement of the armature toward the core.

"These symbols are almost literal pictures of the simple gravity type of relay, where the armature is pulled up against its own weight and falls back when the current is cut off. While the variety of relay designs is almost countless, and many of them actually look very little

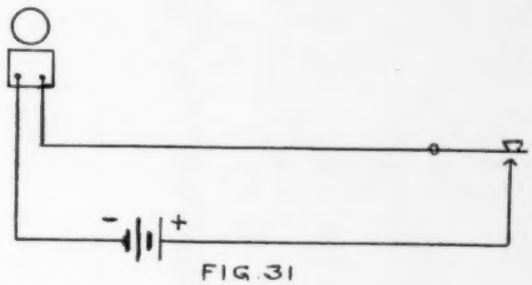


FIG 31

like this, the operation of any one of them can be shown by minor modifications of this simple idea. The side spring relay, for example, with two or three sets of spring contacts, can be shown thus (Fig. 20*c*), where each set of springs is represented by an armature and pair of contact points.

"Only one variation from this symbol is of sufficient importance to require our attention at this time. As shown above, it will be noticed that when the armature is pulled up the back contact opens before the front contact closes. This is true of the majority of relays, but in many circuits we require a relay so designed that the front contact will close before the back contact opens. This idea is illustrated so. (Fig. 21.) Here we have apparently two armatures, one normally resting against a back contact while the other stands clear. When this relay operates, the second armature pulls up, makes contact with the first, and pulls it away from the back contact.

"A somewhat similar symbol is that of the key. A few typical samples are shown here. (Fig. 22.) The function of a key is to close or open circuits mechanically.

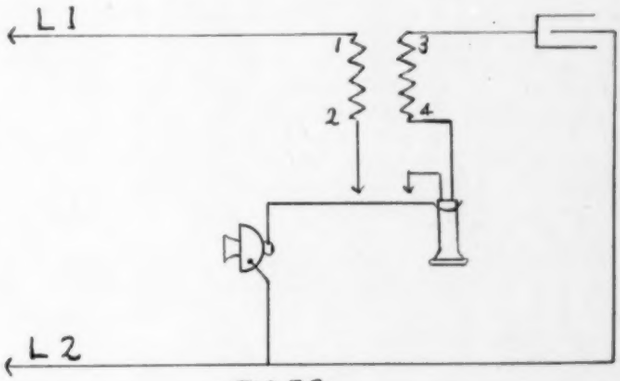


FIG 32

In (*a*) this is done by pressing the button on the long spring. In (*b*), (*c*) and (*d*) a plunger is forced between the long springs, pushing them apart. In (*b*) the circuit is normally open, but throwing the key closes the long springs against the outside contacts. In (*c*) is shown a double throw key, and throwing it either way lifts the long springs away from the inside contacts at one end and closes them against the outside contacts. In (*d*)

we have a somewhat different arrangement, in that the bent inner spring follows the motion of the long spring against which it rests (with a block of rubber between), and throwing the key closes three separate circuits. There is almost no limit to the number of possible key arrangements, but I do not recall any of them which cannot be considered as combinations or elaborations of these simple forms.

"The symbols of a switch hook (Fig. 23) embody the same idea. As the hook goes up when the receiver is taken off it automatically opens the ringing circuit and closes the transmitter and receiver circuits.

"We might draw the symbols of a switchboard jack and plug, the jack looking somewhat like a key. (Fig. 24.) The letters shown at the right of each symbol are abbreviations of tip, ring, sleeve, and local. The tip and ring are so called because they fit and make contact with the tip and ring of the plug, while the sleeve fits over the shank of the plug. This can be more readily seen by referring to the symbols of a plug (Fig. 25), where these same letters are shown.

"A condenser consists essentially of two plates or sheets of metal close to but insulated from each other. This is clearly shown by the symbols (Fig. 26), where the lines representing the plates are drawn parallel and close to each other but not in actual contact. There is considerable similarity between these symbols and those of an induction or repeating coil, in that the lines are drawn parallel and close to each other to show an inductive action between them. The difference is that the condenser shows an open circuit so that the inductive action is evidently electrostatic and not electromagnetic."

"But," began the Helper.

"I know," interrupted the Draftsman, "I skidded off into a little theory there, but I won't let it happen again. Any good book on elementary electricity will tell you what those words mean. Perhaps we may have time to talk about them some other evening.

"An interesting symbol, and one whose full meaning is often not appreciated as it should be, is that used to represent battery. In the original zinc-copper battery the zinc or negative plate was made heavy because it was eaten away by the action of the battery in furnishing current. The hydrogen bubbles which resulted from this action collected on the copper of positive plate, and in time covered it up and stopped the current. The larger the surface the longer the current could flow before this polarizing took place, while it was not eaten away like the zinc the copper did not need to be very thick. The battery symbol illustrates these facts by using a short heavy line to represent the negative plate and a long thin one for the positive. (Fig. 27.)

"Each pair of heavy and light lines may be taken to represent one cell of battery, although in practice we do not usually take the trouble to draw enough of them to show the actual voltage.

"The symbol for ground is very simple, and illustrates the fact that when a current completes its circuit by flowing down a wire into the earth the larger part of it travels at or near the surface, gradually diminishing as we go deeper. (Fig. 28.)

"All of these symbols are representations of ideas and principles rather than of actual apparatus. They are, in a very real sense, pictures of ideas; and convey those ideas in a very much clearer manner than any number of words possibly could do. There is another class of symbols which have been worked out along somewhat different lines, and are simplified or conventionalized pictures of apparatus. They are applicable when the 'way it works' is either immaterial or is so generally understood as not to require representation. Illustrations of this class are the common symbols for a receiver, transmitter, switchboard lamp, and pair of ringers. (Fig. 29.)

"There is still a third class of symbols, which we will not spend very much time on tonight, and whose primary purpose is to show the switchboard man where to connect his wires. (Fig. 30.) This is a symbol of the same repeating coil as that shown schematically. (Fig. 16.) The windings are conventionalized to the last degree and the inductive action between them in pairs is not even hinted at, while the terminals are shown in the same relative positions as on the actual coil. It is obvious that this symbol tells us practically nothing about how the coil works, but leaves no room for misunderstanding as to where each wire should be connected. Similar symbols may be drawn showing how to connect up a relay or any other piece of apparatus, but these do not interest us just now.

"Now that we have learned the alphabet we are ready to begin talking—or rather writing—this new language.

"We will take first, as the simplest case, an ordinary door bell circuit. This consists essentially of a bell, a push button—which is practically a single contact non-locking key—a battery, and the wire connecting them. (Fig. 31.)

"Starting at one pole of the battery, for instance the positive, where the current originates, we may trace its path through the wire to the push button, where the circuit is normally open. Pressing the push button closes the circuit through the bell back to the other pole of the battery, allowing the current to flow and ring the bell.

"The circuit of an ordinary common battery subscriber's set will carry us a step farther, and is shown here. (Fig. 32.)

"Here we have a combination of the symbols for a transmitter, receiver, induction coil, condenser, and switch hook. We have studied them separately, now let us see what happens when we put them together. In the first place, both the transmitter and receiver circuits are normally open at the upper contacts of the hook, but are closed when the hook is allowed to go up by taking the receiver off. The transmitter is bridged across the line, and talking into it affects the current in the line directly. The receiver is in a local circuit, and we hear by induction from the primary or line winding of the induction coil to the secondary.

"Tracing the circuit more in detail, the current flows from *L 1* through the primary winding of the induction coil, the upper contact of the hook, and through the transmitter to *L 2*. In the secondary circuit we go from the secondary side of the induction coil through the condenser, transmitter, upper contact of the hook, and through the receiver back to the induction coil."

"Why do we need the condenser? Why is the transmitter included in both the primary and secondary circuits?" asked the Repairman.

"Say, young man," was the answer, "Why don't you ask me to explain in a few minutes what makes a street car go? This is one of the most interesting problems I know of and will take all of one evening to discuss."

"Meeting adjourned," said the chairman.

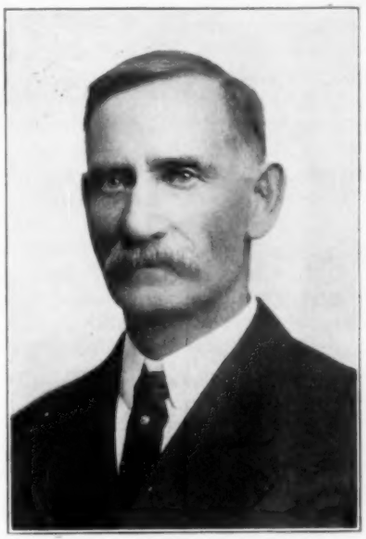
(To be continued.)

The Work of the National Association

Annual Address of the President at Chicago, February 3, 1915

BY JUDGE N. G. HUNTER

YOUR attention is called first to what is commonly designated the modified long distance toll line proposition submitted by our competitor, the American Telephone and Telegraph Company, to the Department of Justice in December of 1913, wherein the telephone interests, independently speaking, both large and small, became profoundly interested, not only to learn as fully as possible the meaning of the proposition, but also to determine, as far as they might, the practical workings thereof, if accepted and set in operation. Within a few days following the annual meeting of 1914 your board of directors was called in conference in Chicago, with N. C. Kingsbury, the active vice-president of the American Telephone and Telegraph Company, together with his engineer and counsel, and at once took up the discussion of the proposed agreement.



Judge N. G. Hunter, Retiring President of the National Independent Telephone Association.

After a day, or better, of earnest discussion pro and con, by way of explanation of the several sections of the proposed agreement, your board of directors, in view of the explanations given, felt called upon to make some answer thereto. By resolution it declared that, in its opinion, such contract, as explained by its authors, was fair and reasonable. It made no recommendation as to what any particular company should do in reference thereto, but stated that it must be governed by the conditions and circumstances which might surround each particular case. This action of your board, in some quarters, was harshly criticised, while in others it was justified and approved. But, upon the whole, the contract seemed to be unsatisfactory, on the part of member companies, and on the part of independent telephony throughout the country.

I shall not attempt to give dates respecting other and further conferences, having to do with the matter. In the course of a few weeks a sub-committee, consisting of C. Y. McVey, of Cleveland, Ohio; Terry W. Allen, of Jackson, Tenn.; F. B. MacKinnon, of Washington, D. C.; A. F. Adams, of Kansas City, and your president, together with a like committee appointed by the Independent Telephone Association of America, consisting of C. B. Randall, of Minneapolis, Minn.; W. J. Uhl, of Logansport, Ind.; John H. Wright of Jamestown, N. Y., and B. G. Hubbell, of Buffalo, N. Y., repaired to New York City by appointment. Again the officials of the Bell telephone company were engaged in conference with the committee in reference to the contract, and certain modifications thereof were demanded, so as to make it more acceptable, if possible, to the independent companies of the country—it being then and there agreed by all parties that, in its original form nothing had been or would be accomplished thereunder. The modifications of the contract sought by the joint committee were as follows:

First: That an additional charge of ten cents shall be made on every message at the originating end on other than long lines business, this additional charge to be paid to the Bell company.

Second: That a commission should be paid the Independent companies for originating business in return for the use of their terminals.

Third: That each company shall be allowed to route the message originated by it.

Fourth: That the independent companies shall have the privilege of entering into a contract for long lines business only.

In answer to the foregoing demands, Mr. Kingsbury of the Bell company, stated that he was without authority to grant any of the modifications asked for, but that he would have the matter submitted to a full meeting of the officers of the American Telephone and Telegraph Company and its subsidiary companies, which meeting would be held the last week in October. He also requested that this association submit to him, in writing, the modifications desired, so that he might have it in proper form to present to his associates.

On or about October 29, 1914, in the city of Columbus, Ohio, the joint committee met Mr. Kingsbury in the Southern Hotel.

At this time he informed them that propositions one and two, as previously stated, would be modified to read as follows:

First: That an additional charge of ten cents shall be made on every message at the originating end on other than long lines business, this additional charge to be paid to the company called for. Second: That five cents per message shall be paid the independent company on business originated by it, whether toll or long lines, and that sections three and four were not acceptable and would not be acceded to.

Upon further and final consideration of such contract your committee answered Mr. Kingsbury to the effect that they would recommend to their respective associations that all companies desiring to enter into such contract do so, providing the following changes be made, to-wit:

First: That an additional or differential charge of ten cents shall be made on every message at the originating end, on other than long lines business, the ten cents to be paid the terminating company.

Second: That a compensation of five cents on messages of 50 cents or under, and ten cents on messages over 50 cents shall be paid the originating independent company.

Third: That the interchange business, when the Bell desires to deliver to the independent company at point of origination to be carried to its destination by the independent company, providing there are commercial independent toll lines between the point of origination and terminating exchange.

Fourth: That an independent company shall have the privilege of entering into a contract for long lines business when originating at a connecting point.

The joint committee again met Mr. Kingsbury and his legal adviser, Mr. Hopkins, in Hotel La Salle, Chicago, January 13, 1915, and the further consideration of the toll contract was taken up. After an all day's session, in the discussion of the many problems involved, no material concession was gained, and nothing of a definite character determined upon one

way or the other. Upon motion, the matters of such contract were continued for further negotiations.

It follows, therefore, that while your directors have neglected no opportunity to induce a material modification of said contract, and have in part succeeded, still, nevertheless, the end sought—that an easier, workable agreement be had between ourselves and the Bell people—is far short of what we should have. It appears at this time that ultimately the Interstate Commerce Commission will be called upon to settle the question for us; it may be hoped on equitable lines, having regard to all parties concerned. It is regrettable that a matter of such importance to the independent interests of the country, should not have been arranged upon broad-gauged principles, so that all might find comfortable standing room within its terms. But local conditions that often differ materially in one location as against another seem to forbid a satisfactory solution and adjustment of this contract or agreement.

In view of legislation already enacted and more to follow, which could hardly be anticipated respecting the general interest of the telephone business of the country, the present administration deemed it advisable to shift its headquarters from Chicago to Washington, D. C., for the current year. This was done so as to be near, not only the Interstate Commerce Commission, but the Department of Justice and the Congress of United States, to the end that our interests might be more promptly looked after, and a better understanding had on the work sought to be accomplished. We were also enabled, when the nature of our work was understood, to meet the heads of the several committees having to do with legislation concerning, or that might concern, public utilities.

Among the most important for active consideration was the measure known as the Reyburn Bill, involving as it did, all common carriers without exception, requiring them before issuing securities or stock in any amount, to procure a permit or license from the Interstate Commerce Commission. This measure in its original form, and as it passed the lower House, would have so hindered, obstructed and delayed telephone construction, extension, or even repairs requiring a considerable outlay, as to have practically paralyzed every independent company in the United States. By the prompt, intelligent action of your secretary, with such little aid and advice as your president was able to give—both being present on the ground at the time—aided somewhat by a personal acquaintance with members in charge of the bill, we were able to have telephone companies excepted from the measure, thus saving, in this matter alone, thousands of dollars of expense, and relieving the telephone interests of the country from the most aggravating, unnecessary and burdensome legislation it is possible to conceive.

When the war measure was introduced laying a one-cent charge or tax on each message of 15 cents or over, the burden, as usual, was to fall upon the companies. But the substance, at once being communicated to our Washington office, we were able to present the situation in such light to the chairman of the committee in charge of the bill, United States Senator Shively, as to cause the tax to fall where it fairly belongs—upon the sender of the message. The telephone interests were thus relieved of an estimated burden of $2,000,000 for the current year.

Another matter of much importance was in obtaining permission with the Department of Justice and Interstate Commerce Commission, to enter our appearance for member companies who might, for any reason, be required to appear and answer the call of the Interstate court or of the Department of Justice.

Having in mind at all times the general welfare of our association, and its members especially, it was deemed advisable to meet with state telephone organizations, when at all practical. Accordingly, your board of directors was called in special session at Indianapolis, September 15, 1914, for the transaction of business and to attend the annual convention of the Indiana Independent Telephone Association. At this meeting, among other things receiving attention by your board of directors, a special committee was appointed to go to New York City to confer with N. C. Kingsbury with reference to the toll line contract. Your board, on the invitation of S. G. McMeen and G. R. Johnston, of the Ohio State Telephone Association, was invited to attend their state convention at Columbus, Ohio, October 29, which invitation was accepted.

Pursuant to this, the board met at Columbus, and there heard the report of the special committee on the toll line contract. In company with a like committee of the Independent Telephone Association of America, it participated in a further conference with Mr. Kingsbury at the Southern Hotel. During the session of the board, the subject of consolidation of the two national associations came up for consideration. A committee was appointed to confer with a like committee from the other association, with instruction to agree, if possible, upon a plan for the consolidation of the two at the earliest practical moment—it being the sense of your board that the best interests of independent telephony would be better, more efficiently and more effectively conserved thereby.

The Ohio convention, considered from every viewpoint, was a marked success. The attendance, not only of resident members, but men prominent in the work from other states, especially Indiana, New York, Pennsylvania and Michigan, was the largest in the history of telephony ever held in the city. We have good reason to believe, and do believe, that the presence of the National Board and of the representatives of the Independent Telephone Association of America, did much to enhance the enthusiastic interest manifest on every hand. The banquet given by the state association was, indeed, a delight, not alone the elegant menu, splendidly served, but the several addresses there delivered by prominent men and officials of the state, especially the address of the statistician of the state of Ohio, were profoundly interesting and impressive in calling attention to the system of accounting, valuation, etc., and the magnitude of the business, and the colossal sums invested in the state by the several telephone companies thereof. Based, therefore, upon such observations as we have been able to make, both in Indiana and Ohio, it should be a fixed policy of this association in the future, to so finance its affairs as to enable its representatives to attend the meetings of every state organization in this great union; and to encourage in every legitimate way the Independent telephone movement. By so doing, a great national association will be built up,

and strengthened in every quarter of the country so as to be almost invincible. When so done, the ghost of government ownership will forever disappear.

In the matter of finance, your association has probably fared quite as well for the past year as in those gone by, but the increased cost of management has exceeded the budget heretofore. We have collected from all sources, the sum of $13,291 and expended $13,219, leaving a balance in the treasury of $72. From the past and the most careful observations we have been able to make, this great organization should be financed to the full extent of $20,000, so that means would always be in reach to enable it to carry out any necessary or expedient project or duty that might arise; and so as to defray the actual expenses of its respective directors in attending meetings of the board.

Independent telephony stands today more prominent and promising before the business world than ever before. It stands us in hand that no backward step be taken, or ground surrendered, in the fight for justice and nation-wide supremacy. Our National association stands for fair play in the field of reasonable and constructive (not destructive) competition. When that fails, a conservative control by governmental authority in the interest of vested rights on one hand and the patronizing public on the other, is the tribunal of last resort wherein may be found protection for us all.

Those of our fellow citizens who believe in the theory of our government, respective property rights, and the inalienable privilege of handling our own in our own way as guaranteed by the federal constitution, know that the nation's progress and the prosperity of the country are because every man has the right to his own; and that individual initiative, together with the product of his own hand and brain, shall be protected in so far as he abides by the laws of the land. But, while this theory is very fine, there has grown up in our midst—and to some extent it has been encouraged because of its prosperity—a sentiment founded partly on fact and partly on suspicion, evidenced by the socialistic propaganda extant, that all public utilities, especially the telephone, in its alleged abuse of privileges and immunities granted, are robbing the people and public, and that such properties should be taken from their promoters and owned by the government, and through it and by it directed and operated in the interest of the public at large.

We have no intention of entering upon a discussion of the many alleged reasons in support of government ownership of public utilities at this time, as they are all well known and understood by operators throughout the country. But I beg to suggest that many of the causes responsible for such agitation are well taken. Hateful as this proposition and policy may be to us all, it will have to be met in the very near future and reckoned with, unless a genuine spirit of active co-operation on the part of the independent interests from every section of the country unites for more comprehensive service than our great competitor now gives or can give, and, with it all fair and reasonable rates for the service rendered. After all, a fairly well managed, locally-owned telephone exchange that gives its patrons service, is always in favor as against the foreigner. Under such conditions it may safely challenge competition in its own field without fear.

In the words of the great emancipator, Abraham Lincoln, "A house divided against itself cannot stand," so that the Independent telephone interests of the Union must, if their individuality shall be preserved and perpetuated in their own interest and in the interests of mankind, become more adhesive than in the past, and develop an active co-operation, one with the other, having a common end in view, based upon lines of fair play and an even chance for all.

There is no use, therefore, for two national associations in our field of endeavor. In the interest of ultimate success, I urge that we get together on common ground, for the line between us is so narrow and dim that a microscope would be required to locate it —and I am not certain then that it would lead to any material point of difference. So let us get together for the common good and stop this eternal wrangling over non-essentials.

In point of educational and social uplift, the telephone business stands second only to our system of free schools. It has developed and brought to the front, as a class, the best educated and scientific men in the United States today. Socially it has developed, and will continue to develop, the very best and most diplomatic side of our natures. In the realm of polite courtesies and clean English, it has left a distinct mark upon the mind of all. Courtesy and gentlemanly bearing, lady-like conduct and sweetness of temper has been the marked characteristic of all those who operate in the telephone world. In the business world it has brought to the front, and is still so doing, the best minds in the country, and the greatest men are turning in our direction.

When one stops to think of the mighty force of the telephone movement in this country as well as in the civilized world, and of the things it enables one to do as compared with the conditions and opportunities a little better than thirty years ago, it seems absolutely miraculous, and in some ways inspired by the supernatural. When one comes to think of the manner of communication now within the reach of all by reason of this development, how the squatter in his cabin in the wild and woolly undeveloped part of the country connected with a thread of a wire is able to communicate his wants to the outside world, and how notwithstanding his humble station in life be, in a moment, in direct communication with the governor of these great states, the president of the United States, we stand appalled at the greatness of man's invention. We feel convinced, if no other and more apparent reasons and objects guide us, there is, indeed, a divine power that shapes our ends for the good of mankind.

Fearing that this address has already grown tedious, realizing that time waits on no man, and that time enough for the transaction of the convention's business is, after all, little enough time, I feel disposed to bring this message to a close notwithstanding the many subjects of interest that might be further considered, as for example, an organization to assist in financing telephone companies; the making and disposition of their securities, the need of which is very seriously felt in the Independent field; also a department of scientific research and development and better methods of accounting and systematic management.

As a forecast, commercially speaking, for the telephone business, if one may judge from the optimistic expressions heard on every hand and from every quarter of the country, a more promising prospect than the present year offers could hardly be wished for. It

would seem, too, in the light of facts at hand, having to do with the industrial affairs of the country, that these expectations are justified, for never in our history have such crops blessed America as in the past year, and prices, generally speaking, are higher than at any period since the Civil War, when the country was on a paper basis for money, and a gold or silver dollar was worth $2.80 in the currency of the country. In fact, the income of American farms for 1914 totals the colossal sum of $3,000,000,000. What reason, therefore, can be assigned by the most melancholy pessimist in the land, why all manner of commerce and trade shall not boom as never before?

Trade depression throughout the civilized world has been on for the last year and a half, and now, so far as the United States is concerned, with its unparalleled agricultural resources, a currency system that has demonstrated its usefulness after two months of active operations, and the country at peace with itself and all the world besides—who can believe for a moment but that the industrial millennium is at hand, and is ours for the taking? So, as an evidence of the spirit and confidence felt in this hour and the immediate future, we should start the boom with a loud noise by shouting the business slogan: "Buy it now." The enthusiasm will grow as the weeks and months come and go.

Any reference to the general war in Europe may not on such occasion as this be just in place, but when one thinks, as one must, of the colossal, the criminal and unpardonable blunder of it all, to pass it by without mention is not to be thought of. When one thinks of the indescribable misery, sorrow and suffering of the innocent millions who ultimately must bear the load of the military hordes prompted by the war devil, who has ravished, like a wild boar, the fairest gardens, homes and fields of northern Europe in their mad, unbridled career to appease the jealous and imperious spirit of the governing classes—when we look upon such a state of affairs, we certainly have cause to congratulate ourselves that we are American citizens.

We have no entangling alliances or private contract with any power on earth, and have an administration at Washington that has given its pledge that so long as its hand is on the wheel, the old ship shall enter no port except the port of peace and good will.

In conclusion, I feel that my remarks would be incomplete, now that I shall retire from further activities in the interest of independent telephony, without an expression of the high regard I feel for the men engaged in this splendid work, and the marked courtesies shown me everywhere and on every occasion. I am also deeply grateful to the association for the distinguished honors it has conferred on me, and my chief regret is the want of ability to have rendered a better accounting and services in its behalf. At the risk of violating the proprieties of this occasion, I might say by way of explanation of my voluntary retirement, that in an unguarded moment of thoughtlessness, the voters of Wabash County, Ind., where I have resided since 1879, elected me to the high office of the circuit judge. As my official duties begin on October 21, next, I feel that in duty to your association, my constituency and myself further service in this field of endeavor is unwise. I shall certainly take with me many remembrances of the worthy acquaintances made during the years I have been more or less active in the field of independent telephony.

Nebraska Independents Convene

Nebraska Independent Telephone Association's annual convention, held January 28 and 29, at the Lincoln Hotel, Lincoln, Neb., showed a registration of 150 telephone men. The entire parlor floor was devoted to exhibits.

The convention was called to order by Vice-President Warren Pratt, who introduced Hon. F. C. Zehrung, mayor of Lincoln. After a speech of welcome by the mayor, the annual report of the secretary and treasurer was read by L. E. Hurtz.

Committees were then appointed and papers presented as follows: "Fair Telephone Rates," by Alfred Bratt; "Collection Methods in Small Exchanges," by Chas. H. Wood; "How Can We Increase Our List of Subscribers?" by J. L. Evans; "Our Workmen's Compensation Law," by G. E. Becker; "Mistakes We Have All Made," by C. E. Coddington; "Most Economical Quarters for Small Exchanges," by D. S. Sylvester, and "Telephone Development in Irrigated Districts," by Fred Alexander.

Presentation of papers was followed by a banquet. The last day's session included the following papers: "Good Roads," by B. A. George; "Interference Between Electric Light and Telephone Wires," by E. C. Hunt; "Things I Have Learned in the Telephone Business," by E. G. Taylor; "Value of Advertising and Publicity," by A. S. Howard; "Valuation of Telephone Properties," a general discussion.

Following these interesting papers, officers and members of the executive committee were elected as follows: C. J. Garlow, president; E. G. Taylor, vice-president; L. E. Hurtz, secretary-treasurer.

Philadelphia Electric Uses Keystone Ducts

Long-pending negotiations for a lease of the unused ducts in the Keystone Telephone Company's conduits by the Philadelphia Electric Company are completed and officials of both corporations issued statements setting forth the terms of agreement. Announcement of the details was made by President Joseph B. McCall for the Electric Company and Vice-President Edward M. Cooke for the Keystone Company. Mr. McCall said:

We have agreed upon the terms of a contract with the Keystone Telephone Company of Philadelphia, which gives us the right to use all the duct space in the telephone company's conduits which they are not using, and to occupy the same as required by us from time to time in the extension or operation of our business. The telephone company retains the right to use the ducts for its own purposes when needed to carry out its obligations and purposes.

The arrangement is one which should be beneficial to the general public as well as to both utility companies, as it produces an immediate revenue to the telephone company for duct space which has been unused for a number of years, and it also makes the same available to the Philadelphia Electric Company for the general purposes of its business whenever and wherever such ducts can be used in conjunction with the present distributing system of the company.

Under the terms of the agreement we are to have the right to the exclusive use of all the unused ducts for the purposes of our business. Provision is made for a graded schedule of minimum rental payments, the maximum of which is $100,000 for the first period of twenty-one years, and at our option at an annual minimum of $100,000 for an additional period of fifteen years. We also have the right to purchase the conduit space in use at the end of the agreement, at a price to be fixed by arbitration. If for any reason we cannot purchase these ducts, we also have the option to extend the agreement for a period of fifteen years, at an annual minimum rental for this latter period of $125,000.

Exchange Girls Talk of Their Work

Brief Stories By and About Some Independent Operators

Selecting and Training Operators

By Flora Stapleton.

Entering the telephone field when I was seventeen, I worked my way up to position of chief operator, which position I held for four years with the Central Union Telephone Company, at Terre Haute, Ind., resigning on account of ill health. I later accepted the position of chief operator at Middletown, Ohio, and held this position a year.

In February, 1913, I became chief operator at La Porte, Ind., for the La Porte Telephone Company.

We try to have a get-together meeting of the operators every so often and the girls try to do what we ask of them, which is always encouraging.—Flora Stapleton.

Flora Stapleton.

TOO much care cannot be exercised in the selection and training of operators, because they are the direct representatives of the company and by their appearance and conduct the company is judged.

In selecting an operator we are usually able to judge to a great extent as to her character and ability from her personal appearance. If she is neat and clean we can rest assured that she will look after the company's interests to the best of her ability. A girl whose dress is showy is, I think, without exception loud in voice as well, and would cause confusion in an operating room, and then she does not give the impression we want the public to have of our company.

The other extreme—the very shy, backward girl who probably has never had a chance and has never been out in the world—with the proper training, will give the best results if we have patience with her.

Last but not least, we should give some thought to the height of an operator. If possible, we should select girls not under five feet three inches, so that they will be able to reach without getting in the way of other operators.

The nervous condition of an applicant must not be overlooked, as a girl too highly strung will become excited on the least provocation and one excited girl causes every operator to become noisy and soon every one in the operating room is talking at the top of her voice.

Then the girl that has no nerves at all, so to speak, is not desirable as she is usually sluggish and without good judgment, and a happy-go-lucky whom we could not depend upon for a moment. As we very seldom strike a happy medium, careful training cannot be too strongly insisted upon.

A pleasant and agreeable manner is most important; not only is it of untold advantage to the company, but it means everything to the operator herself. There is always a demand for such girls, not only with the telephone company, but with all business concerns who employ girls. And right here I want to mention that the telephone school is the best training for a business career a girl can obtain, and remember it is free of charge, and some companies pay a student while she is fitting herself for an operator. How many other business concerns do this?

A pleasant voice, of course, is a part of the manner, especially from an operator's standpoint, where the voice is what the public judges us by. The Michigan Independent Telephone and Traffic Association's bulletin of May, 1914, published an article from *The Business Philosopher* of April, 1914, in which E. M. Watson states: "The voice with the smile wins. It wins because it gives—it is for others a vibrant note of courage, a suggestion of good cheer. No ill-tempered person ever gained more than passing worldly success; for true respect is that of our fellowmen; the consciousness of having served others; true greatness lies in service. During our busy hours we are too busy to give time to others, but we can give courtesy, with a smile in our voices."

Training the student should begin by impressing her with the importance of *rules*. The fact that they are based upon years of experience and practice of thousands of people is sufficient, and yet if the girl is the right sort she may be taught that nothing is perfect and that suggestions are acceptable and from such suggestions good points are sometimes made, but more often you will find the operator has misunderstood or does not comprehend and you are given an opportunity to explain and demonstrate wherein the existing rules are correct.

In training an operator we should always remember that they are human and like to know the reason why, and things are so much more easily remembered if we know the reasons for them. Let us encourage the operator to ask questions, for the better she understands each detail of the work, the operations and the reasons why, the better will be her work. We all know intelligent operators are always best; at least the ones of us who have operated with exchanges where they know nothing of standard phrases and instructions, but run things just as they see fit, will, of course, gladly welcome the day when operating is uniform. This is no fault of theirs, but we as operators can do much more to help them by setting them an example, than can our traffic men by lecturing. Why? Because the operators will say, "so and so is a large office or at least larger than ours, and they don't observe the rules or use standard phrases." Don't let this be said of our own individual offices, and it is up to the operators as well as supervisors and chief operators to see that it is not.

Encourage accuracy rather than speed, for if the operator attempts speed too soon, she will not do accurate work, and speed should be the last thing to be acquired.

Teach the history of the telephone, for there is no more interesting subject, and it will help influence the candidate to take a personal interest in the work and both she and the company will gain by it.

If we haven't the voice with the smile, let us begin now to cultivate it.

More About Qualifications.

By Bess Oliver, Paducah, Ky.

WHEN a business man takes a person into employ, he expects that person to obey orders and do what he, the employer, desires and not what the employe would like to do. So that if "obedience" is not observed, there is no need of observing the other qualifications, since to do an employer's work his orders must be obeyed.

The third quality, "integrity," may be studied from several different points of view. Many persons think that the only sort of dishonesty is theft. However, there are ways in which an employe may be dishonest besides taking something that belongs to his employer. If the employer is absent from the office and trusts his employes to carry on the business just as if he himself were present, and they fail to do this, they are practicing one form of dishonesty. If the employe is not truthful he is dishonest. In short, if he does not discharge all of his duties in the manner that his conscience tells him is right, he is not honest, either with himself or with his employer.

"Courtesy," the fourth qualification, is a quality that is probably noticed more than any other in the business world. The executive heads of a great western railroad consider that politeness in handling the traveling public is a form of advertising that costs nothing but which leaves a lasting impression upon those receiving courteous attention far outweighing the arguments of a printed page. The road, according to the directors, has always endeavored to instill into the minds of its employes the fact that the golden key to success lies in the measure of courteous and careful attention given to its patrons by every employe in whatever branch of the service. In the popularity this company has attained lies the proof that in a very large degree the effort has been successful. A certain textile house in New York is said to have lost a $3,500 order through a display of bad telephone manners on the part of the girl in charge of the house switchboard. According to the buyer he called up this house and asked to speak to the manager. The girl had evidently been instructed to take the names of persons calling; however, instead of saying, "May I have your name?" or, "Who is speaking please?" she demanded sharply, "Who are you?" To this the buyer replied, "I'm a man who is through buying from your house as long as you are there." He said he would not ask for her discharge, but that he intended to buy elsewhere until the house got a girl who knew that "the voice with the smile wins." Of course, the tone of voice used over the telephone is more important than that used in transacting business in other ways, since, as the chief operator at Paris mentioned in her paper, the friendly handclasp and the intimate conversation are here lacking.

Miss Ardelle Isham.

Miss M. Lorden.

However, politeness and courtesy always give pleasure and satisfaction, and it may be found in transacting any form of business that "the voice with the smile wins."

"Persistence" is the next qualification mentioned. Comparatively few people realize the value of sticking to a thing. What some people lack in talent they make up for in persistence. Persistence is the power which enables one to look upon temporary defeat or failure as merely a form of training. The great trees in the forest become mighty through resistance, resisting the powers of wind and weather. The definition of work is "resistance overcome." Dickens has said, "To work and not to genius I owe my success."

"Executive ability" includes accuracy, neatness, speed, etc. In short "Executive ability" means the power to discharge one's duties in the best possible way and certainly, "Whatever is worth doing at all is worth doing well." Also the amount of gain or pleasure we get out of our work depends only upon the loyalty and interest which we put into it. For instance when an employe does his work cheerfully he finds that his employer treats him in the same manner; when he is obedient he receives respect in return; if he is courteous, he receives polite treatment; for his persistence, he receives encouragement from his employer; and for integrity and executive ability he receives better opportunities and higher wages.

We are all given our opportunities. An Irishman once said, "Opportunity knocks at iv'ry man's dure wanst. On some men's dures it hammers till it breaks down the dure, an' then it goes and wakes him up if he's asleep, an' afterwards it worruks f'r him as a night-watchman. On some men's dures it knocks an' when they come out it hits thim over the head with an axe. But iv'rywan has an opporchunity." Let us then take care that we may not be like the man who is asleep when his opportunity arrives—or like the one who allows his opportunity to run away from him or like the man who must be hit over the head with an axe before he realizes his opportunity, but rather, when our opportunities present themselves let us enter into our work with our whole interest and our energy and remember what we get out of anything is measured only by what we put into it. In conclusion I would say that a good motto to remember and practice through life is that "If you give to the world the best you have, the best will come back to you."

Miss Payne at Logansport

Through an error in reading copy, Miss Ethel Payne was mentioned in January as chief operator at Fort Wayne, Indiana. As most Indiana operators know, however, Miss Payne is located at Logansport.

Some Michigan Company Operators

A NATIVE of Muskegon, Michigan, graduated from the public schools of that city, Miss Etta Bourdou, chief operator, United Home Telephone Company, Mus-

kegon, started in the telephone field as a local operator in May, 1907. Her faithful and diligent work secured for her a promotion as night chief operator. In March, 1908, she assumed the duties of trouble and information clerk. It is not necessary to have a very lengthy conversation with Miss Bourdou in order to realize her ability. No doubt this talent was one of the chief factors taken into consideration when she was promoted to the position of chief operator in the year 1911. She is always wide awake and a hard and earnest worker, applying the science of taking up those questions that relieve the line operators from the annoying details that delay calls. She plans the work so that she is in touch with the details and "knows that she knows" she is right. By setting the pace herself and not asking the operators to do anything that she would not do herself, she has the respect and courtesies of her staff.

CHIEF Operator Katherine Wurdock, Bay City, Mich., having always lived in Bay City, started work for the Valley Home Telephone Company as local operator in 1906. She was appointed assistant chief operator and for the last two years has filled the position of chief operator. The following is a brief testimonial which may in a measure account for her success as chief operator:

"I have never worked out of the independent field and never sought work in the other. I always liked the independents' way of doing business, treating their employes as human beings and not as a 'mere cog in the wheel.' Whenever I view the 'Independent Shield' it not only arouses patriotism for our beloved country, but inspires me with the 'liberty and freedom' and a 'square deal' to all, which is emblematic of independent telephony.

"I believe we have the largest magneto exchange in the state of Michigan. We serve about 1,600 subscribers and we owe our success, with a magneto exchange, in these days of modern appliances, to courtesy and co-operation, and in order that the operators may be courteous to the subscribers, we strive to treat them with courtesy. When we have occasion to talk with one of our operators, in regard to her duties, we do not switch in on her and say 'operator,' we salute her by saying 'Miss Jones,' or whatever her name may be. It makes her feel that she is a human element in the working of this exchange, instead of just a 'cog in a wheel.'

"From courtesy naturally follows co-operation, and we get co-operation from our operators because all of our operators are treated alike. We make a special effort not to show partiality, and we advance our operators in order of seniority. We insist at all times during business hours that our operators address each other as 'Miss Jones,' etc., thereby adding dignity to the office and the honor and respect that is due each operator."

A PROMOTION has been received by Miss Ardella Isham from the duties of chief operator to that of bookkeeper and collector of the Union Telephone Company at Alma. In her former field of work Miss Isham made many friends, which was no doubt due to her retiring disposition and a sweet and pleasant voice. From her past experience as chief operator, her work in the new line of duties should be a success as it is essentially necessary that one who does the check ledger work and billing, should be familiar with the toll line work.

BORN at Marshfield, Ohio, Miss Margaret Russell attended the public schools of that city, and graduated from the high school at Shinston, W. Va. She entered the employ of the company as local operator in 1909, accepting a similar position with the Michigan State Company for a period of a year, when she again returned to the Citizens Company as local operator. She was promoted to information clerk, and later to supervisor, and in 1912 became chief operator. Miss Russell has shown special qualifications for her present position on account of the manner in which she takes a personal interest in the operators under her charge. By so doing she has been able to develop the kindly spirit of co-operation that makes for the good of the service. We reprint her paper on "How to Eliminate Check Errors." This was submitted with the others and was considered valuable enough to create a special prize and is well worth reading and retaining the valuable points:

"As a result of personal observations, I wish to submit the following suggestions for your judge's approval not entirely, however, because of the $5.00 prize offered, but because I think that if the suggestions are observed, that it will improve the service for the independent telephone companies and their patrons.

"First: The tickets should be examined by the operator very critically when either sending or receiving a call and again after the call has been completed, and before filing ticket away making sure that nothing has been omitted. Being sure that the distant office checks the same as the originating office.

"Second: The time should be compared in cases of overtime, noisy circuits, disconnected calls and repeated messages.

"Third: Accepting the time checked by the originating office as final, or make received tickets only in case of *appointment* calls, messenger and collect tickets.

"Fourth: If it is necessary to continue making received tickets, after recording ticket, the distant operator should be sure to read it back to the originating operator.

"Fifth: Too much information cannot be given on the back of tickets, giving detail of any irregularity or discussion arising while handling a call.

"I believe that if the above could be carried out in connection with the rest of the good rules in our "Operating Instruction" book, many errors will be omitted from our check reports; such as failure to check overtime, to notify the operator at the receiving station that the message is to be sent collect, to check the correct rate and to check and report all messages."

Training the Student Operator

By Miss M. Lorden, Traffic Chief, Terre Haute, Ind.

REALIZING the necessity for a thorough training for telephone operators, a school where students are taught the different branches of telephone operating has been established at Terre Haute, Indiana, by the Citizens Independent Telephone Company.

Local: All applicants are received in person by the chief operator. The regular application blank is filled out, and after a few necessary questions, the applicant is advised that she will be notified when wanted. The chief operator then files the application, and if desirable, the applicant is sent for. When the applicant reports for duty, the chief operator explains our different hours of duty, Sunday work, salary, etc. All students are paid while learning. The student is then taken to the school room where the instructress takes the student in charge

(sometimes the class consists of from one to five students) and is given the individual attention of the instructress. Students are given a copy of our "General Instructions to Operators," pertaining to the general deportment and rules of our office. After reading over our rules, each student is questioned regarding anything in the rules that she does not understand. Instructress then explains and makes clear all questions. For instance, the peg count seems hard to understand, but after explaining why we take a peg count and its importance, the matter is perfectly clear. The instructress then requests the students to read aloud several paragraphs of reading matter. This, of course, gives the instructress an idea just what kind of training will be necessary in order to develop the most essential feature, "the pleasant voice." Sometimes it takes several hours to have the student repeat "Number, please." with the proper inflection. This being done, all phrases are gone over several times in question and answer form. Students are required to commit to memory all phrases. The instructress then explains the switchboard, multiple, markings, keys, and the names of all the different switchboard parts and the correct handling of them. (This usually takes our first day of school.)

After the student has studied the phrases and committed to memory the meaning of our different multiple markings, she is then requested to draw on the blackboard a copy of a bank of jacks. Not having the multiple in the school room, this blackboard serves the purpose instead. The instructress then calls different numbers, requesting the student to repeat the number and locate it at the same time. We have obtained good results from this method.

After two or three days of this training, the student is taken into the operating room and both the instructress and the student occupy one of our light positions. The student answers subscribers and the instructress listens, continually coaching and instructing. If more than one student, we arrange to have one student listen with an operator while the instructress works with another student. After three or four days of continual coaching, our student is fairly proficient.

Of course, all students are not adapted to our work and if at the end of three days the student has no conception of the work, the instructress so advises the chief operator, and the chief operator informs the student to that effect and efforts towards further instruction cease.

Long Distance: Whenever possible our long distance operators are selected from the local operating force. We find by doing this a considerable amount of instructions can be dispensed with as the local operator has been trained in some of the qualifications necessary for an efficient long distance operator.

Our first day in school is spent in reading and discussing the long distance "Operating Rules" code, its use, and to understand how to apply the code.

The second day is spent in a thorough drilling in writing tickets, which have been taken from actual business handled, so that the student will become familiar with names of stations and firms with which we do business. Then a study is made of reading the calculagraph. After explaining the calculagraph the student is requested to read the elapsed time from tickets which have been filed. In this way the student learns to read the Calculagraph accurately. All of our different tickets are explained to the student and everything made entirely clear before she listens in at the switchboard. We find it more conducive to our student's progress if she understands just what is being done while she listens to the operator work. After two or three days' listening, students make copies of all tickets passed and received. When the work at this particular position is not too heavy, the student may ask questions. This keeps her mind concentrated and alert. Anything that she does not thoroughly understand is explained fully and made clear to her. In this way the student is continually learning some part of the work and makes rapid progress.

Special training upon weak points is given during a course of two or three weeks, after which our student is capable of covering a position during the light hours of the day, and frequently can be classed as a regular operator—of course, under the watchful eye of our supervisor.

Michigan Companies Plan Merger

Maps showing the number of telephones in service of both the Michigan State Telephone Company and the United Home Company in the territory of Mason, Muskegon, Oceana and Newaygo counties, served by the latter, are now being prepared. Thomas Bromley, Jr., United Home Company's manager, says the maps are a preliminary step to a division of territory.

The two companies have been negotiating for a year or two and have asked the state railroad commission for permission to divide the territory so that it will not be duplicated, or else to allow one company to purchase the plant and lines of the other. That the members of the commission look with favor on the proposition is generally believed and it is expected that permission will be given if the consent of the United States authorities can be shown that the consolidation of the two plants is not a violation of the anti-trust laws.

Illinois Independents Hold Enthusiastic Meeting

Four hundred telephone men attended the tenth annual convention of the Illinois Independent Telephone Association held at Leland Hotel, Springfield, Ill.

The convention opened with a speech of welcome by Mayor John S. Schnepp. The opening session was of especial interest, featuring a conference and question box under the direction of Chief Clerk M. J. Murphy of the Illinois Public Utility Commission. H. D. Currier opened the afternoon session with an interesting address on "Transmission." Many interesting addresses and papers followed, including an address by Hon. O. F. Berry, formerly of the Illinois Railroad Commission; "Telephone Accounting," by LeRoy Parker; a very favorable secretary's report, by B. F. Baker, and a comprehensive address by Miss T. Anne Barnes on the evolution of operating to a dignity of vocation.

A splendid banquet and a grand ball furnished a general good time to all those attending.

Special interest was displayed in the school of instruction which was conducted by W. S. Vivian during the first two days of the meeting.

"An Idea," by Manford Savage, and other interesting speeches by Hon. Richard Yates, President E. B. Fisher, O. W. Burgess and B. H. Boynton were followed by the election of officers, which resulted as follows:

J. W. Barrett, president; Ed. D. Glandor, vice-president; B. F. Baker, secretary-treasurer.

The convention was said to be the best-attended meeting ever held in the history of the association. Many local people were in attendance and evinced much interest in the good work which the association is doing.

Public Utility Commission News

Reports Concerning the Activities of State Regulating Bodies in the Telephone Field

Missouri

A COPY of the order issued by the Missouri Public Service Commission in the matter of the valuation of the Joplin exchange of the Home Telephone Company, has been received by Mayor Hugh McIndoe from T. M. Bradbury, secretary of the commission.

Detailed provisions of the order are as follows:

Commission declares intention to learn value of the exchange and to hold a hearing on the matter of rates.

By May 1 the telephone company shall file with the commission a complete inventory, verified by the managing officer of the company, showing separately each kind and class and quality and quantity of its property, together with a statement of its original book cost and an estimate of its reproduction value and present value.

Company shall file with commission by May 1 a complete report of accounting records showing the necessary information of the exchange at the close of the last fiscal year.

A statement showing the following information for the last three years:

Number of subscribers receiving each class of service at beginning and end of each year.

Average number of subscribers receiving each class of service at beginning and end of each year.

Statement of special rates, if any, for the last three years.

Engineers and accountants of the commission shall make complete examination of all accounts and property of company and report a correct inventory and appraisal and make a report covering financial history of the company, its capitalization and indebtedness, and also a true analysis of all the income and expense accounts of the company.

Company shall submit its books to commission engineers and admit engineers to all parts of its property.

Nebraska

Following a recent storm the state commission has received several appeals from small telephone companies, in which the latter desire to know how they may proceed to repair the damage. The case of the Milburn & Anselmo Telephone Company is typical.

That company writes that it has been hard hit and has no money with which to rebuild. The rates were not sufficient to guard against such an emergency. Now it cannot issue stock; it can't borrow, and it is practically helpless. On one of its main lines it has seven poles to the mile flat on the ground.

Massachusetts

The House, by a vote of 112 to 100, adopted an order directing the public service commission to investigate the New England Telephone & Telegraph Company to ascertain the relations, contractual or otherwise, between it and the American Telephone Company; to ascertain what relation exists between the said telephone company and the Western Union Telegraph Company with regard to the receipt and delivery of telegrams; to ascertain if the American is still charging 4½ per cent of the gross receipts of the New England Company for use of the instruments, etc., and other facts relating to the telephone business, together with a study of rates and charges. The commission under the order is to report its findings, with recommendations, on or before March 15 of the present year.

The House committee on rules had voted to recommend that the order be not adopted, and the House overturned the committee.

New York

The State Public Service Commission has continued its hearings in the Metropolitan Tower, in the investigation of the affairs of the New York Telephone Company.

Dean Langmuir, an accountant employed by the Public Service Commission, the first witness, gave statistics showing how the local telephone companies were successful since their inception, to September 30, 1909, at which period they were all consolidated into the New York Telephone Company. The New Jersey Telephone Company, at the time of the merger, he said, showed a surplus of $4,332,642.

Mr. Langmuir testified to the growth of the New York and New Jersey Telephone Company by giving figures which showed that in 1883 the assets and liabilities amounted to $2,536,002.62 while in 1909 they had grown to $39,438,956.99.

William McClellan, chief engineer of the Public Service Commission in charge of telephone rate investigation, testified that the difference in cost of equipping buildings, etc., in and out of town was not great enough to account for the great difference in the cost of charges.

Ohio

The struggle of the users of the independent telephone service in Hamilton for long distance service to Cincinnati has again been renewed before the State Utilities Commission. Soon after the creation of the public service commission in 1907, the people of Hamilton, in three separate proceedings before that commission, sought and were refused an order requiring the Hamilton Home Telephone Company and the Cincinnati and Suburban Bell Telephone Company to connect and afford toll service to Cincinnati, where the telephone business is in the hands of the Bell monopoly.

In the case instituted recently by a rural subscriber of the Hamilton company, it develops that the complainant uses the service of the independent company in a locality where the Bell company makes no attempt to operate. This condition is entirely different from the conditions presented to the commission in 1907 when the Bell company was able to show that every complainant could, if he so desired, secure service from its Hamilton exchange and, through it, toll service to any point in Cincinnati.

Copies of the complaint were served upon the defendant companies, who were notified that if the complaint were not satisfied the commission would fix a date for hearing it.

The extent to which a receipt by a telephone company is binding upon the company would seem to be generally misunderstood, if an informal opinion by the Ohio Public Utilities Commission is correct. A L. S. Ford of Jefferson county complained that the Bergholz

Telephone Company collected his rental for one year in advance last January and the receipt given him so stated. In April, 1914, the company increased its rates, and Mr. Ford declines to pay for a service for which he says he holds a receipt

The commission has advised Mr. Ford that a receipt by a telephone company is simply an evidence of the amount of money paid by the subscriber for which he is to be credited, and that the law requires telephone companies to furnish the same kind of service to all subscribers for the same rate, which, in his case, requires the company to repudiate the endorsement carried on his receipt.

Iowa

Members of the Sioux City council have indicated they would fight the passage by the present legislature of a bill placing the telephone companies of Iowa under the supervision of the Iowa State Railway Commission, thereby making void all existing ordinances under which telephone companies operate in the cities.

Opposition was expressed by council members because it was felt that the measure would take from the city control of the telephone business, now obtained by ordinance, and that too much power would be vested in the commission, with too great expense attaching to any pleas for improvement of telephone conditions that might develop from time to time.

Under the existing ordinance, governing the Sioux City Telephone Company, the city receives two per cent of the company's gross income. Mayor Smith said that the voiding of the existing ordinance, under which this company operates, would take from the city the power to collect this two per cent fee. The same ordinance provides that the company shall not merge with any existing company and provides for permanent competition between telephone companies. This feature of the telephone ordinance also would be abolished, making certain the immediate merging of the two companies, which are now said to be operated by capital controlled by one group of telephone men.

Pennsylvania

Discrimination in rates by the Central District Telephone Company is alleged in a complaint which has been filed with the Pennsylvania Public Service Commission by the Johnstown Telephone Company. It is averred that in certain cases the toll charge is 15 cents for nine miles, while in other cases it is only five cents for from nine to 23 miles.

The alleged discrimination is cited as affecting subscribers in Johnstown, Cresson, Ebensburg, Portage, South Fork and Windber.

The Bell Telephone Company has some contracts by which calls to the points named in the above-cited complaint cost five cents for three minutes. Those calls are on the basis of merely getting a subscriber the number wanted, allowing the patron to run chances on getting to the other end of the phone the person wanted. In 15-cent calls the company guarantees to get a particular person to the telephone at the other end of the line.

On Windber business the Bell line charges five cents per call, on the hit-or-miss basis, under a contract with the Windber Telephone Company. In cases of calls to Windber over the Johnstown lines, which were recently readmitted to participation in the Windber business, ten cents is charged, five cents going to each company in the interchange. Some Johnstown Telephone Company advocates hint that the Windber system is owned by the Bell and that that is the reason why the Bell charges only five cents for Bell-Windber calls, while insisting on five cents clear in the division with the Johnstown system.

The difference between five-cent and 15-cent calls may apply to a wider zone as well as to a narrow one, distance not being the basis of charge there, but the difference in service rendered.

South Dakota

The State Railway Commission has decided in favor of the Centerville Telephone Company of Pierre in its contention as to what constitutes a residence telephone, and as to what constitutes a business telephone. The contention was on the part of O. C. Sheppard, a veterinary surgeon at that place, who uses his house telephone for the transaction of his veterinary business, and does not maintain a telephone for office use. The board holds that where a business man maintains a business telephone in his office or place of business and pays a business rate for its use he may transact even a large part of his business over his residence telephone as he has paid a business rate, and at the same time get a residence rate on the house telephone he may use for business. But in the present case no other rental was paid except for the telephone at the residence of the veterinarian, and the instrument was used for the business of the doctor, and it is held that he must pay the business rate even though the instrument may be located in a residence instead of an office.

Texas

A bill declaring telephone and telegraph companies to be common carriers and placing them under the regulation of the Railroad Commission has been introduced in the House, requesting that the commission shall have power to fix rates and other regulatory supervision of these companies.

Michigan

For six years or more Reading has been a center of the discussion between the Independent and the Michigan State Telephone Companies, and the recent consolidation of the Michigan State and the Southern Michigan caused the trouble to again break out.

A few months ago the Reading Central Telephone Company bought up the Bell lines and equipment in Reading, the latter placing their through toll lines in the office of the Independent company. This was apparently a satisfactory arrangement until the Michigan State and Southern Michigan merger went into effect. The Bell people have since refused to transmit toll calls that come into the Hillsdale office over independent lines over any other independent line.

Owners of the Reading company protested to the State Railroad Commission. There were also present at the hearing representatives of the Camden, Allen, Hillsdale County, and Michigan Independent Companies.

Commmissioner Hall ruled that the Reading company had the right to use the independent circuit not only to all parties in Hillsdale but to all telephones in the state and that when a telephone call originated at any Independent station anywhere in the state for Reading or through Reading that it should be routed all of the way over independent lines and especially over the Reading circuit.

New Jersey

Reductions in the yearly rate charged for individual line measured service from $42 per year to $39 per year, and in the per message rate charged for private branch exchange calls from three cents to two and one-half cents have been announced by the New Jersey division of the New York Telephone Company.

The new rates will go into effect February 1 and will affect practically every exchange district in Northern New Jersey.

According to the announcement of the company, measured service refers to telephone contracts, which limits the number of messages sent to 600 per year. Under the present rates subscribers on direct lines entitled to send 600 local messages per year have been paying $42 per year rental.

The new schedule of rates is the result of a very careful study of telephone conditions made with the assistance and co-operation of the New Jersey Public Utility Commission.

Approximately 1,200 subscribers to private branch exchange service will receive the benefit of the lower rate for additional messages. It is estimated that the total reduction will mean a saving to telephone users of some $73,000 annually.

Since February 1, 1913, as a result of the studies of the Public Utility Commission and the company, general reductions in toll rates and exchange rates have been made voluntarily by the telephone company in New Jersey. The saving to telephone users by reductions made since February 1, 1913, is more than $620,000 annually.

Contending that the New York and New Jersey Telephone Company has no right to increase the rates to its Bayonne subscribers under the terms of a contract entered into between the company and the city in 1883, a delegation of Bayonne business men representing the Bayonne Chamber of Commerce, appeared before the Public Utility Commissioners.

The complaint stated that the new schedule demanded $105 a year for service that formerly cost but $60 a year. When the New Jersey Telephone Company came to the city of Bayonne in 1883 and secured its franchise it entered into an agreement with the city that is now binding upon the New York and New Jersey Telephone Company which has succeeded the first named company.

The franchise was signed February 7, 1883, and before it was given to the company the latter signed an agreement to charge residents of the city no more than $5 a month for unlimited service in the city and between Hoboken and Jersey City, according to the protest. The number of years the franchise and the agreement were to operate was not fixed.

Missouri

After a hearing in Jefferson City, the Missouri Public Service Commission approved a rate schedule of the Home Telephone Company of Joplin, by which the company's proposed increase in rates goes into effect February 1, 1915.

The commission's approval was provisional, however. It is provided that an inventory of the company's property is to be made by an engineer appointed by the city of Joplin, the expense to be paid by the telephone company.

If this engineer's report, which is to be filed with the public service commission not later than May 1, shows that increase is excessive, the rates will be reduced and the telephone company is to refund to subscribers the difference between the rates temporarily allowed and such rates as are finally fixed by the commission.

Provision also is made for restitution to subscribers who may discontinue telephone service before rates finally are fixed permanently. When the money is not claimed within a year, however, it shall be released to the Joplin city commission.

The only revision of the company's schedule was that the charge for four-party selective line service shall cost $1.75 a month instead of $1.85, as first proposed.

Virginia

A rule has been issued by the State Commission against the Lexington Mutual Telephone Company, calling upon that corporation to explain its failure to comply with that requirement of the state law directing it to make connection with the Natural Bridge Telephone Company for the convenience of the patrons and subscribers to the two corporations.

Wisconsin

And now comes the Wisconsin Telephone Company with an application to the Railroad Commission of Wisconsin to vacate its order requiring physical connection in La Crosse of toll lines of this corporation and the La Crosse Telephone Company.

The appellant company holds, in its petition just filed with the Railroad Commission, that public convenience does not require such connection and the order is unreasonable and unjust.

The order of the Railroad Commission, requiring physical connection of toll lines in La Crosse, which was issued under a law enacted in 1911, upon petition of Frank Winter, has been in force since September 9, when the switchboards of the competing companies were connected.

It is presumed that the Wisconsin Telephone Company will contend the volume of business is not sufficient to warrant the maintenance of the physical connection arrangement.

The Wisconsin Telephone Company on December 1 filed suit in the circuit court of Dane county against the Railroad Commission, attacking the supplemental order of the board in the La Crosse case apportioning the toll charges between the two companies in calls where a message is transferred from the lines of one of the corporations to those of the other.

Washington Forms Independent Association

Washington independent telephone companies have organized an independent telephone association consisting of representatives of about twenty-five companies with the following officers: J. M. Winslow, president; C. J. Farmer, vice-president John King, secretary-treasurer.

Eastern Washington Companies Organize

The Independent Telephone Association of eastern Washington has been formed during a meeting of Washington companies operating in Washington. J. F. Goldbach was elected president; C. P. Lund, vice-president, and A. C. Welterer, secretary-treasurer.

Telephone System at Changsha

That the telephone industry in China is developing rapidly is indicated by several modern telephone installations that have been recently completed in various cities. The Chinese have realized the advantages of the telephone for government as well as commercial uses and are beginning to recognize that telephone systems, properly designed and managed, will yield profits.

At Changsha a new and modern system was opened last July with American equipment of the central-battery type, with lamp signals. It has a present capacity of 1,000 local lines and 40 toll or long-distance lines, and is arranged for an ultimate capacity of 3,000 lines, equipment for which may be added as desired. The new system replaces a system of the magneto type, equipped for 350 lines. The central office is housed in a modern brick building.

The switchboard consists of three 6-panel sections, each section having a capacity for 480 answering jacks with lamps and 3,000 multiple jacks. Each section is arranged for three operators' positions and each operator's position is equipped with 15 pairs of cords and plugs. One position of the switchboard is equipped with toll-switching trunks for making connections between toll lines and local lines. The switchboard is so arranged that sections may be added as the number of subscribers increases.

In addition to the main switchboard there is a single-position desk-type toll switchboard with equipment for 40 toll lines. The telephone company intends to install toll lines into the surrounding country. One such line has already been erected—from Changsha to Siangtan, a distance of about 30 miles.

The power apparatus and terminal racks and frames are located in a room directly beneath the switchboard. Wiring between the switchboard and the frames is contained in cable placed on steel racks. These racks are designed to accommodate the amount of cabling that will be required for 3,000 lines.

On the relay rack are mounted the line and cut-off relays that control the lamp signals of the subscribers' lines in the switchboard. To the left of the relay rack is located the fuse board on which are mounted the fuses for protecting against heavy currents the various circuits of the switchboard. The fuse board, relay rack, and distributing frame are arranged for future growth.

Electric current for operating the switchboard and subscribers' telephones is obtained from a battery of storage cells located in a small room adjacent to the terminal room. This battery consists of 11 chloride-type cells and has a capacity at present of 50 amperes, which may be increased to 100 amperes by the addition of battery plates. There is also a smaller battery of 11 cells for increasing the voltage of the talking current on subscribers' lines when connected with long-distance lines.

Current for charging the storage batteries is obtained from a motor-generator set operating from the city's electric-current supply. Another charging outfit, consisting of a generator belted to a gasoline engine, is intended for use only in case there is an interruption in the municipal supply.

The lines from the central office to the subscribers' telephones are carried in cable to various distribution points at which are located cable terminals. The cable for this purpose is steel-armored, lead-covered, paper-insulated telephone cable, is installed in sizes of 300-pair, 200-pair, 100-pair, and 50-pair, and is laid directly in the ground.

The subscribers' telephones are furnished in wall and desk styles, and are of the metal-case type with black enamel finish. As is usual in China, these telephones are equipped with a microtelephone hand set.

The new system is under the control and operation of the Hunan Provincial Government.

Report Holds Automatic Franchise Void

The franchise of the Illinois Telephone Company, Chicago, apparently was placed in jeopardy by a report submitted to the city council at its last meeting by the department of public service.

The report showed the company had only 12,476 telephones in service, whereas the number requisite to hold its franchise is 20,000.

The figures in detail, based on an investigation by Montague Ferry, commissioner of public service, are:

Instruments installed	18,761
Working and not paid	380
Ordered out, but working	2,982
Abandoned, premises vacant	1,008
Abandoned, new tenant, working	507
P. B. X., working, not paid	24
Privately owned terminals	568
P. B. X., ordered out, but working	500
Abandoned	128
Ordered out, but working	75
Ordered out, but working	12
Working, not paid	97
Ordered out, but working	4

As a result of this showing, it is considered likely that the city will begin suit to bring about the forfeiture of the company's franchise or the Chicago Telephone Company may purchase the property. A valuation of $2,000,000 was placed on the Automatic company's holdings a year ago by Ray Palmer, city electrician.

An opinion by Corporation Counsel Sexton just before he retired from office may prevent the city from bringing forfeiture proceedings. Mr. Sexton held the city would have a doubtful case against the company. A court, he thought, might construe the law to mean that the franchise was valid if the company were in a position to operate 20,000 telephones.

Keystone Increases Renewal Fund

The complete annual report of the Keystone Telephone Company, issued recently, showed that the management had transferred from the surplus account a large amount to the depreciation and renewal fund, the latter being increased $64,905 over the previous year, and standing on December 31, 1914, at $1,305,990. Reference was not made to this action in the report, but as the appropriation from the year's earnings to the renewal account was only $155,076, it appears that approximately $500,000 was taken from the surplus fund for that purpose. The surplus was decreased from $1,356,686 to $899,465.

It is understood the policy of the management is to establish a renewal and depreciation reserve on the basis of about $4 per telephone in use.

Out of the net profits of $357,516 for the year, there was charged, in addition to the depreciation fund above referred to, $8,934 for bond discount, and paid in preferred stock dividends $116,211, leaving a surplus of $77,294 for the year.

Nathan T. Folwell, the president, said the total capital expenditures during the fiscal year ended December 31, 1914, had been $294,091. There were retired $90,000 collateral trust bonds, being the balance of the issue made on purchase of the Eastern Telephone and Telegraph Company.

European Telephone Development

Translations from the Foreign Press and Communications from European Engineers

BY FRED W. SCHOLZ

THIS last of the installments of this article will take up the wiring of operators' places in semi-automatic operation. As in the older system, the operators' switchboards have, aside from the call and supervisory lamps for each of the four (10,000 system) or the five (100,000 system) sets of keys a supervisory lamp and a double call lamp. The latter shows whether there is a call at the same time for both key sets of the same operator. The relays required for the coupling of the operating mechanism and the sending of current impulses are not placed near the operators' tables, but at special tables, so that these individual units can be changed easily in case of trouble.

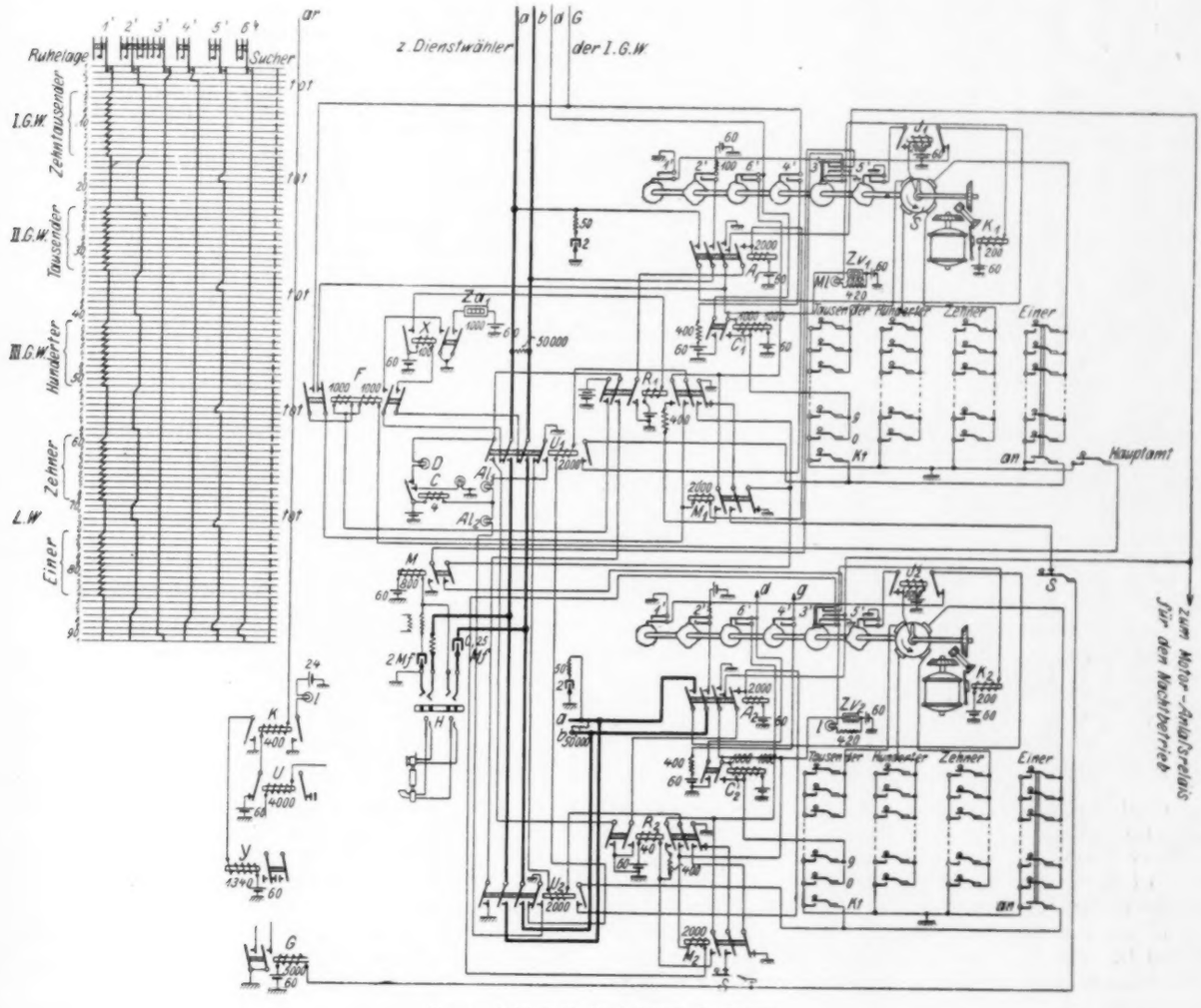


Fig. 1. Wiring to Semi-Automatic System.

Keys and generators work in the following manner: If the C'-relay of a I-group selector is excited by way of the c-wire, then the current circuit of the trunk line cut-off relay T_1 of the proper trunk selector is made ready for action. In addition the current circuit of the rotary electromagnet is closed, when the B-relay of the I-group selector has been excited by the action of C' (earth, b, c, t_1, D, UK, interrupter, voltage). If the trunk selector has reached the line to an open key set, then T_1 is excited and the trunk selector remains at rest. At the same time the 600-ohm winding of the T_1-relay is short circuited, so that further trunk selectors cannot interfere with this line, as their cut-off relay has not enough current.

As soon as an operator of the exchange connects by plugging her jack H, the M-relay in the microphone current circuit acts. This relay closes the circuit of relay M_2, whereby the first key set of the operators' equipment is made ready to receive the call. In addition the

current circuit for M_2 gets ready to attract its armature as soon as the first key set is busy. This makes the second key set ready for work. If the trunk selector stops with its *d*-finger at the first key set, then T_1 and R_1 of this operator's place is excited (earth in the I-group selector, *c'*, *d*-line, T_1, *d*-arm of the trunk selector, *6'* m_1, R_1, voltage). Relay R_1 connects the U_1-relay (earth, u_2, U_1, r, t_1, v_1, voltage), and bridges the branch lines of the operator's telephone to the subscriber's line. Through excitation of T_1 the telephone line coming from the translator has been connected by way of the selector fingers of the trunk selector, T_2 is as yet not excited so that the operator can speak with the subscriber. She calls for the desired number and sets the keys as requested. R_1 prepares a current circuit for A_1. If the last unit key is pressed down, A_1 is excited. A closes the current circuit of a motor starting relay and of the coupling relay K_1, which, when acted upon by U_1 has not been excited due to the high resistance of the relay. At the same time the supervisory lamp ML lights up and stays

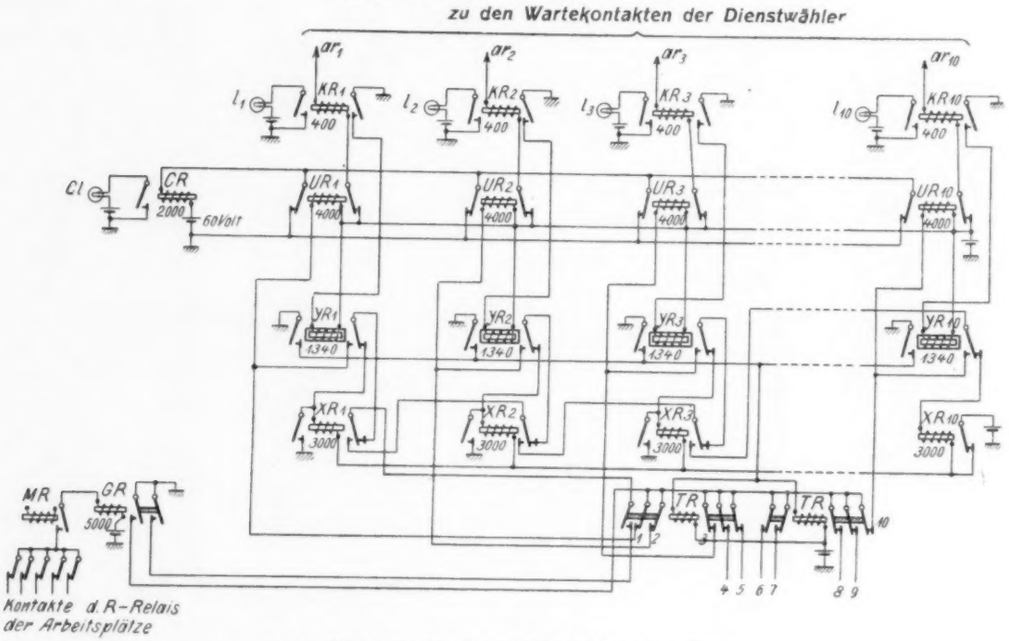


Fig. 2. Wiring Diagram for Waiting Control Lamp Panels.

thus until the call is finished. At the same time relay U_1 is short circuited. U_1 lets its armature drop, the supervisory lamp AL_1 goes out and the telephone instruments of the operator are again ready to receive a call over the second key set of the switchboard. The contact discs of the automatic unit begin to move, as its shaft is coupled by relay K with the motor shaft. The current impulse is sent out over the *a*- and *b*-wires in the following manner:

At the beginning of the rotation of the disc the disc *4* closes its contact and prepares a current circuit for the cut-off relay T_2, the trunk selector. Through the operation of T_2, the calling subscriber is disconnected during the time of sending the current impulses. In addition a current circuit is formed for T_2 to the *c*-line over one of its armatures. T_2 also forms a new short circuit for the 600-ohm winding of the cut-off relay T_1, whereby the action of the trunk selector is independent of the relay C' of the I-group selector. The discs *1*, *2*, and *5* aid in sending the current impulses. The contact of disc *1* which has been bridged by the blow-out at the *a*-wire is still open. When the disc rotates, the contact will experience in the 10,000 system, 4x10, in the 100,000 system, 5x10 closings, when the contact spring touches on the various contacts. The *a*-branch will therefore be connected 4x10 and 5x10 times with earth. In order to receive none but the number of current impulses corresponding to the keys pressed, a contact indicator S runs synchronously with the shaft of the contact discs, which checks the various contacts in their order. The key pressed corresponds to a grounded contact, touched by the indicator, the two numbers agreeing. If the contact indicator reaches this contact, the *a*-branch has been grounded as often, depending on the numbers pressed by the operator, and as the indicator now rests on a grounded contact, the relay J_1 is excited, whose current circuit has been influenced by the contact of disc *5*. J_1 will then stop above its contact and suppresses the current interruptions occurring in the ten-digit group by disconnecting the contact at disc *1*. Only after the indicator has tried all ten contacts of the ten-digit set, the contact of disc *5* is again opened temporarily, so that J_1 becomes currentless. This is repeated until all the details of the desired number have been tested out. After all contacts have been tested by the indicator, the discs have completed one rotation and the mechanical unit comes to rest, as the current circuit for the R_1 relay and therefore also for the T_1-relay is short circuited by the disc *6*. Likewise the circuit of T_2 is again broken by disc *4*, so that connection can be made between the two subscribers. The contact for T_1 is immediately closed again before the disc comes back to the test position, so that the key set is ready for a new call.

The distribution of calls on the two operators' places is regulated, so that at first only the first key-set is used. While this is going on, no call can reach the operator's second set, as the circuit is closed for M_2 only after the first key set is busy with one call. If all the first and

second sets are busy, further calls reach a special control lamp signal field which is at a special table near the supervisor's table. Of the multiple contacts present in each 25-part trunk selector, one in each set is connected to the answering keys in a way differing from the others. Its line connects, as Fig. 2 shows, to a special control lamp panel.

The number of lamps burning in this panel shows at any time how many calls are waiting to be cared for. If the number of these lamps passes a certain number, arrangements must be made for further service. If on the other hand no lamps at all burn in this panel, the exchange has too many units for the service. The wiring for this waiting panel is such that incoming calls go to the first open line that offers. If the operators' places are busy the *m*-contacts are closed. The contacts of the *R*-relay on the other hand are open at all the places where a call is waiting. If then all the key sets are busy with calls, the *G*-relay, which normally would be under current, becomes currentless. As long as the *G*-relay is excited, all the *U*-relays are excited, and the *ar*-lines are, when key sets are open, disconnected from the current

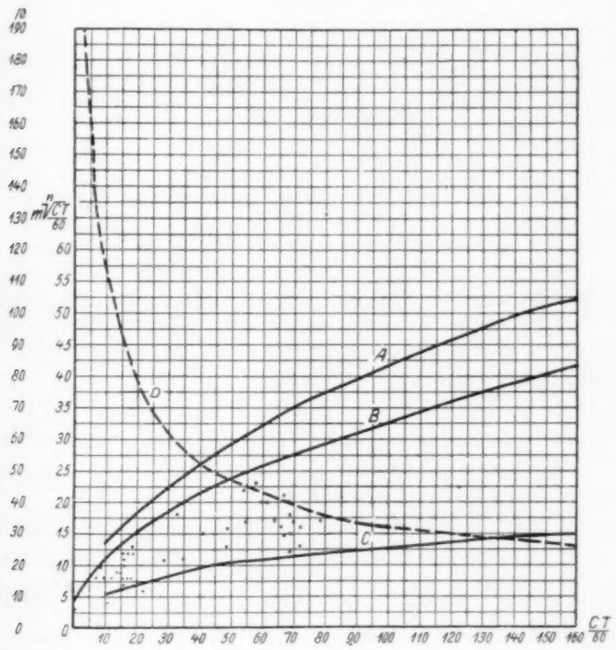


Fig. 3. Diagram for Traffic Conditions According to Formulas.

source. The trunk selectors when testing for an open wire cannot stop at the *ar*-lines. If, however, relay *G* lets its armature drop, i. e., if all the key sets are busy, the *U*-relays become currentless and the trunk selectors can come to rest on the waiting lines (*ar*). At the same time the *K*-relays of those lines are excited, where calls are busy, that is, where trunk selectors have stopped. The *K*-relays influence the lamps of the control lamp panel mentioned, and the corresponding relay *Y*. Through *Y* the relays T_1 and T_2 are excited. The *U*-relays hereby become independent of the earth contact of *G*. If a key set becomes free and *G* is excited again, then, if Y_1 should be excited, a current circuit is closed over the one contact of *G*, *t*, x_1, y_1, U_1, so that U_1 is excited and the *ar*-line is interrupted at the contact of the U_1 relay. The result is, that the T_1-relay of the corresponding trunk selector becomes dead and its rotary electromagnet is again connected. The trunk selector will begin its rotations again, and will stop at the open operator's wire.

If a call has come in on ar_2 the action for holding the call in the waiting panel is the same. If *G* is then excited, provided there are no calls at ar_1 and ar_2, we get first a circuit for X_1. X_1 is excited and stays above its armature. In the same manner X_2 is excited and held. This process repeats for ar_3. Here, however, since a call is waiting, Y_3 is excited, consequently U_3 will speak and the call waiting at ar_3 will finish as did the one at ar_1.

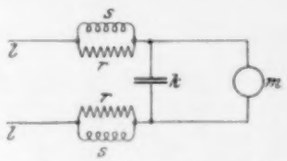


Fig. 4. Protection Against Excess Voltages.

The *X*-relay chain has the purpose of preventing the answering of the calls on the ar_1 line first, at all times. As the *X*-relays are excited in rotation, the interruption of the *ar*-line will start there where the disconnecting action has stopped. Only after in this manner X_{10} has been excited will all the *X*-relays drop their armatures as the common current connection has been broken by X_{10}.

In closing, a general view of the situation in the inter-exchange traffic will show that the conditions for automatic exchanges and semi-automatic exchanges are different from those for manual operation. In the latter we have both the *A*- and the *B*-operator to make a connection. In the former we have either the method where the operator asks the exchange name and connects the subscriber to that exchange, letting the other exchange operator call for the number and make the connection, or the system, where the first operator asks for both exchange and number and then calls over an inter-exchange line and then makes the connection directly for her subscriber. In the system here described it makes no difference whether the subscriber asks for a number in his own or in any other exchange, as connection is the same except that the lines are perhaps longer where another exchange is required. In trying to decentralize the system it is therefore very important to use the right theoretical principles as a basis for operation. The pre-requisite is that traffic shall not be congested at any time in spite of the fact that connections to any exchange can be made by any subscriber. We have work in this line by numerous men. Thus Campbell used the empirical formula:

$$V=\frac{CT}{60}+2.8\sqrt[3]{\frac{CT}{60}}$$ where *V* is the number of lines; *T*, the average time of conversation and *C*, the number of calls during the heaviest traffic. Within recent times

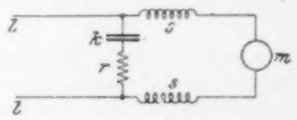


Fig. 5. Protection Against Excess Voltages.

tests have been made with traffic conditions and several engineers have made the study of telephone traffic conditions the subjects of their doctor's dissertations. In all the cases the theory of probabilities is used in guaging the probable future traffic conditions for which provision must be made. The Western Electric Company uses the

formula: $V=\frac{CT}{60}+4.2\sqrt{\frac{CT}{60}}$, and Christensen the formula: $V=\frac{CT}{60}+m\cdot\sqrt{\frac{CT}{60}}$, in which m with increasing TC value of 4.74, at $\frac{CT}{60}=1$ to 3,3 and at $\frac{CT}{60}=80$ decreases, in order to remain almost constant.

These formulas show us that for good traffic conditions the number of connections equivalent to the value $\frac{CT}{60}$ is not sufficient. The ever changing traffic conditions may call in the one minute for a larger number of lines, in another for a much smaller number. How many lines more are needed, then corresponds to the average is shown by the second formula: $\left(m\sqrt{\frac{CT}{60}}\right)$

Figure 3 is interesting in that it shows graphically the values for the additional lines when figured according to the different formulas. The curves show how many more lines are required under the different values of $\frac{CT}{60}$ if allowances are to be made for traffic congestion. If for example, the computation were to give for $\frac{CT}{60}$ as average number 80 lines, then according to Western 80+38 lines are needed, according to Christensen 80+30 and according to Campbell 80+12 lines.

Readings:

A=Western $4.2\sqrt{\frac{CT}{60}}$; B=Christensen $3.3\sqrt{\frac{CT}{60}}$; C=Campbell $2.8\sqrt[3]{\frac{CT}{60}}$; D=curve of percentages. The curves were drawn for the values of: $m\sqrt[n]{\frac{CT}{60}}$ and $X=\frac{CT}{60}+m\sqrt[n]{\frac{CT}{60}}$

The relations between CT and m with Christensen are:

$\frac{CT}{60}$	m
1	4.74
5	3.88
10	3.66
20	3.53
40	3.38
60	3.34
80	3.30

These formulas were tested in the Liegnitz, Dresden and Leipzig exchanges under ordinary operating conditions. The curve gave the maximum calls coming in at any one time. The difference between this value and the average value $\frac{TC}{60}$ is the number of the excess lines needed at any time. The results obtained from this study are shown in the diagram by the dots in the lower left hand section. It is seen that all the points lie above the curve of Campbell and on or below Christensen's curve. In other words Campbell's curve does not make enough allowances for traffic variations, while the Western curve takes too great a safety factor. To show that the traffic fluctuations which must be considered, are the greater in proportion as the line groups are smaller, the curve of Christensen has been worked out on the percentage basis, seen in D. It shows that for example in a group of 160 lines only about 26 per cent of the total calls need to be allowed for in excess, while for a group of 30 lines this percentage is 62 per cent. Observations in practice have also shown that in automatic exchanges it is better to avoid the term "conversation time" CT, but speak of "busy time" of the selectors and lines $(CT+b)$, so that the formula of Christensen should be changed to read:

$$V=\frac{CT+b}{60}+3.3\sqrt{\frac{CT+b}{60}}$$

The reason for this is, that the selectors or trunk lines connecting the various selectors may be kept busy and closed for traffic not only through conversations but also other causes like trouble, interruptions, etc. On the whole, however, it seems that the Christensen formula gives the best results.—*Telegraphen u. Fernsprech Technik. Conclusion.*

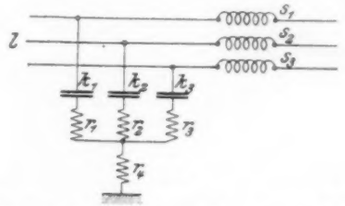


Fig. 6. Protection Against Excess Voltages.

PROTECTING TELEPHONE LINES AGAINST EXCESS VOLTAGES.

The use of choke coils in cables and overhead lines as a protection against excess voltages is not as efficient as desired, as has been shown by past experience. Both the choke coil and the condenser have the disadvantage that, although they do not influence the low period operating voltage, and keep away disturbances from outside causes from the generator or the instruments, up to a certain degree, they reflect the energy of the disturbing electric current unweakened to the lines. These stray disturbing currents wander back and forth on the lines, until they are finally eliminated by the small line resistance.

It is possible, however, to find a satisfactory protective arrangement, which will completely absorb every disturbing electric wave and transform its energy into Joule's heat. In this case there would be no reflection of the disturbing wave nor can it pass over to another more distant line by way of the safety fuse or device. To obtain the desired efficiency, it is not sufficient to use only self-inductance and capacity or only self inductance and resistance, or capacity and resistance, but one must necessarily use the three elements, self-inductance, capacity, and an ohmic resistance which shall be in relation to the characteristic of the lines to be protected. That the protection must have an ohmic resistance is clear enough, when we remember that it is to destroy currents of every possible wave form. As ohmic resistance we will here

understand every device in which electrical energy is destroyed and transformed into another kind of energy. The use of self-inductance and capacity in common is explained by the fact that every concentrated self inductance will reflect every type of electric wave with the same sign, while a concentrated capacity would reflect the wave in general with a changed sign in front of the wave's theoretical equivalent. If the reflected wave is to be removed, this can be done only through a common operation of self-inductance and capacity, whose own waves neutralize each other. If the resistances are estimated properly so that they completely absorb the disturbing waves, such a protection will permit no current to pass. The theory gives the principle, that the ohmic resistance is about like the characteristic of the line to be protected.

A very effective protection is shown in Fig. 4, where the instrument or generator set *m* is to be protected. We have the concentrated self-inductances *s*, and behind these are condensers *k* between the lines. The resistances *r* are in parallel with the self-inductances. The normal operating current is hardly affected by the protections but passes through the inductances *s* and past the capacity *k*. Every stray current coming from the line *l*, cannot enter the self-inductance *s*, however, but finds its path through the resistance *r*. It is reflected at the condenser *k*, so that it again has to pass through the resistance *r*. If the self-inductance and the capacity were of infinite magnitude, there would result complete destruction of the disturbing waves in the resistance. As both are limited, however, this is not possible, but the magnitude of the damping resistance *r* can be adjusted in such a way, that only a very small portion of the disturbing energy is passed through the resistance to the line.

In Fig. 5 we have a similar effect, except that here the condenser *k* is provided with a series resistance *r* and is placed in the lines *l* before the self-inductances *s*. The effect is similar to the one described before. Here we see clearly that the waves reflected by capacity and inductance will neutralize each other, using the opposite signs, so that the entire energy of the disturbing waves is eliminated in the resistance *r*. These two protections are so arranged that for each stray current wave there is formed in the condenser *k*, which short-circuits the lines when necessary, a potential node with a current loop, or else that through the self-inductance *s*, the rapid and high speed waves are prevented from passing and the current potential node and current loop are formed. In either case the line loop is short circuited only over the resistance *r* during the passing of the stray currents and the energy which might disturb operation is destroyed.

As the magnitude of the damping resistances depends partly on the characteristic of the lines to be protected, various size resistances must be used for the different lines of a multi-phase system. The characteristic of each line related to earth is in general greater than the characteristic of the same line when related to that of another line. It is therefore advisable to make the resistance against earth greater than that against another line. This will eliminate not only all disturbing factors between any two lines but also all disturbances between line and ground. Fig. 6 shows such a protection, where the resistances r_1, r_2, r_3 are used for the damping effect of the lines towards each other, and the resistance r_4 for protection against earth. In long distance telephone lines it is, of course, possible to use these protections at any point so as to absorb the disturbances at various points and not have them reach the final terminals. The resistances which are used are best constructed of material having a high specific resistance, so that they shall be able to act in reality as concentrated ohmic resistances. As concentrated self-inductance and capacity for these ends we consider any artificial increase of the line inductivity and the line capacity. It is not essential that special condensers and self-induction coils be placed in the line.

An effective concentrated self-inductance could be constructed, for example, by passing the electric conductor through concentrated thin sheet iron discs, in which a powerful self-induction field can develop. These discs can also be provided with an air gap in order to decrease the effect of the changeable permeability. As concentrated capacities it would be possible to use, aside from electrostatic and electrlytic condensers, for example, short cable lengths placed in the line or parallel to it, employing cable lengths that have a higher capacity than the line to be protected. The new protection has the advantage of not only destroying dangerous excess voltages, but also of eliminating the danger of stray waves due to a sudden drop in voltage. Some of the electric waves that are so dangerous for the dielectric and its disruptive factor are completely absorbed by the device.

If there are excessive increases in the voltage

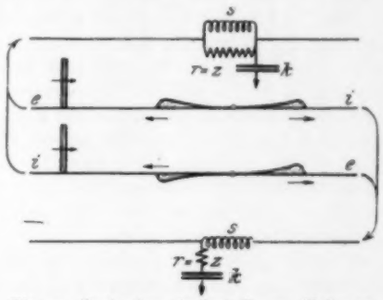


Fig. 7. Protection Against Excess Voltages.

through static discharges, the insulation of the condensers is, of course, exposed to a powerful stress. To prevent disruption, parallel lines can be used, which shall short circuit the condensers, when the voltage rises to a dangerous height. Such parallel protectors might be in form of horn gap arresters or additional special damping resistances employed. Fig. 7 gives a comprehensive idea of the effect of the new protection on a line, where almost the entire effect of the disturbing wave is destroyed and only harmless small waves are permitted to pass either backward or forward.—*Elektrotech. Zeit.*

IMPREGNATION SYSTEMS FOR TELEPHONE POLES.

Recently several new methods have been found which add to the large number of impregnation processes which are to protect telephone poles against attacks by fungi and by worms. The one which is advocated by the Frenchman Charles Nordon uses electricity as an agent. The method is best applied in the summer, when the trees are in full bloom. The warm summer air is said to help materially in the success of the method. The apparatus for the process consists of a traction engine and motor which operates a small portable saw, an alternating current dynamo, electric cables and lights for illumination at night. At the timber place the trees are felled by the aid of the saw and are then ready for the electric treatment. On a wooden flooring, the poles are laid out in rows so that between each two rows a wet material, used as electrode, can be placed. In this way electric couples and columns are created through which the alternating current, generated by the generator connected to the traction

engine, is sent. The current is sent through the poles for about ten hours. While this is going on, a new set of poles is prepared for treatment. Then the poles are exposed to the air for drying. After several weeks they are dried. Nordon claims that the electric current makes the fibres and cells of the poles proof against all attacks by moisture, fungi and worms, and that the current removes out of the pores of the tree all those gumlike and hygroscopic substances that are liable to injure the pole.

Another method, also French, has been patented. It uses the acidic rosins, which are by-products during the refining of heavy mineral oils with sulphuric acid. These rosins are mixed with such solvents as benzine or petroleum, which remove the last oil remnants, and then the rosin is washed in water to remove the sulphuric acid. The rosins are then soluble in water. This soluble product can then be mixed with tar, creosote or other impregnation liquids, giving, however, insoluble precipitates with heavy metal salts. The impregnation liquids are then used as usual on poles.

TELEWRITER.

A new telewriter is described, which consists mainly of a mirror, which can be rotated on a horizontal axis, parallel to the surface of some light-sensitive paper. This paper will send out, when the mirror is rotated, a light ray which is parallel to the axis of the abscissae. There is also a second mirror which is rotated on a vertical axis, parallel to the surface of the sensitive paper, which in its rotation will send out rays of light parallel to the axis of the ordinates. The two mirrors are under the influence of two very sensitive d'Arsonval galvanometers, which are connected by electric wires. Each position of the mirrors in relation to the position of the sensitive paper corresponds to a certain point of light thrown on the paper by the mirrors. In the sending apparatus each position of the point of the pencil determines a certain value of each of the two resistances, which are connected to the wires between the galvanometers and the mirrors. The movement of the pencil will bring resultant similar movements to the light-sensitive paper, and the movements at the sending station and the receiving station are identical. A device causes an electric lamp to light when the pencil touches the paper, and makes the lamp go out when the pencil leaves the paper, as would be done when a new sentence is started, when a word is finished or punctuation marks used. The luminous point tracing the movement of the pencil makes its path on the paper. The paper is then developed by a photographic process and will give the words written at the sending station. When the person at the receiving station wishes to answer, he takes up the pencil, which automatically connects the two stations. A lamp above the writing tablet at either station shows whether the line is open and ready to take communications. As soon as the pencil has been put down, a motor at the receiving station starts the mechanism to develop the transmitted message, the paper being developed, fixed and then dropped into a basket at the side of the receiver. This process which makes all the luminous points appear in black on a white ground takes about 30 seconds for development.

PROPERTIES OF CRYSTAL RECTIFIERS.

While investigating the properties of galena (lead sulphide) crystals for use as rectifiers, their relations to various frequencies as high as 268,000 per second were investigated. The results obtained for the different frequencies were then compared with those obtained for 60 periods per second, so that the latter acted as standard. The influence of the contact pressure (between 40 and 550 g.), caused no great influence on the results at 60 period per second. Tests with higher periods, up to 100,000, showed that the influence of the contact pressure could be neglected, if the rectified current did not pass beyond 20 microamperes. The influence of the temperature on rectifying was shown by a decrease in rectifying effect with increasing temperature. With very high temperatures the rectifying effect vanished. For the influence of frequency the results proved, that with larger currents the rectifying effect increases with the frequency, but decreases slightly with the frequency in the case of lower tension currents. For very small currents of 2 microampere of the rectified current, the rectifying effect is less than 10 per cent. For currents of 500 microampere it is more than 80 per cent. The rectifying ratio varies in wide limits with the square of the rectified current, or with the first potential of the total current. The independence of rectifying from contact pressure for larger currents is displaced for smaller currents by a great dependence. For very small current intensities the rectifying effect is almost negligible, especially when large contact surfaces and low current tensions are used. With larger currents the rectifying effect is satisfactory even for larger contact surfaces. The rectifying effect for very small currents can be improved by the use of very small contact surfaces. If resistances are placed in series with the rectifiers, the rectifying effect is decreased to a considerable extent, even though the same potential difference is connected to the terminals of the rectifiers, as were used without the resistance.

EMBARGO ON TELEPHONE INSTRUMENTS.

Among the articles whose exports out of Germany are prohibited are telephone and telegraph instruments, including wireless outfits for both. In addition bare copper and aluminum wires, cables of all types, and all copper insulated wires, whose cross section is greater than 35 cir. m. are under the ban. The export laws regarding goods made of copper, aluminum, tin, lead and nickel are restricted to those that are made either entirely or to the largest part of these metals. Those articles that contain only relatively small portions of the metals or alloys of the same may be exported. Outside of the above articles the Empire has not forbidden the exportation of electrical supplies and the members of the electrical industries are therefore looking for ways and means to ship these supplies and to open new markets to take the place of those that were lost through the war. It may be said in passing that the low tension insulators cannot be exported, while high tension insulators may be exported at any time.

Convention of Arkansas Independents

Hotel Marion, Little Rock, Ark., was chosen as the headquarters for the annual convention of the Arkansas Independent Telephone Association, held January 26-27.

Thirty-eight companies were represented at the meeting.

Interesting addresses were made by F. B. Murphy, F. B. Sprague, T. J. Rainey, E. A. Farris, W. M. Graham and L. M. Emerson.

Following these addresses, officers for the ensuing year were elected as follows: R. L. Swindler, president; Charles McKee, first vice-president; L. M. Emerson, second vice-president; T. J. Rainey, secretary and treasurer.

Recent Telephone Patents

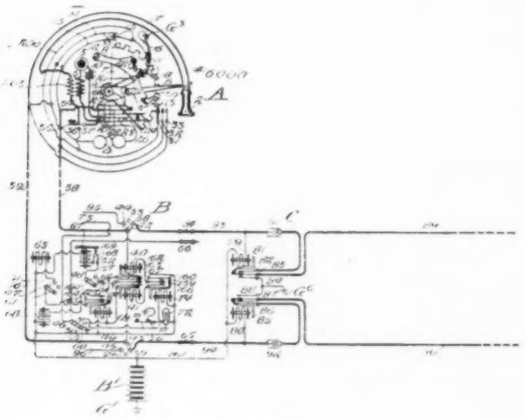
A Brief Digest of those Current Specifications Most Interesting to Telephone Men

BY DAVID S. HULFISH

NO. 1,123,339. Automatic Telephone System. Issued to T. G. Martin, Chicago, Ill., assignor to First Trust and Savings Bank, trustee, Chicago, Ill. (Filed June 16, 1906.) Th system provides for party lines in an exchange of the Strowger type, using earth circuits for signaling to the exchange. At each party-line telephone, a relay is provided to remove the signaling earth connection, and a second or "latching relay" for controlling the first relay.

1,123,340. Automatic Telephone System. Issued to F. R. McBerty, Antwerp, Belgium, assignor to Western Electric Company, New York, N. Y. The improvement concerns the testing of a telephone line by an automatic selecting switch. Two relays are provided in the switch, both of which respond when an idle line is tested, one of them operating to render the line busy by test and the other operating to stop the movement of the selecting switch.

1,123,476. Coin Telephone System. Issued to Odilon Brisbois, Chicago, Ill., assignor of part to William Lorimer, Jr., Chicago, Ill. In the complete telephone set, there are three instruments to be considered, the speaking instrument, such as the transmitter, the signaling instrument, such as the hand generator or automatic call sender, and a float-arm switch in the coin collector box. The signaling instrument cannot be used until a coin is deposited upon the float



No. 1,123,506.

arm, and the speaking instrument cannot be used until after the coin has been removed from the float arm, presumably into the till of the coin box.

1,123,506. Automatic Telephone System. Issued to John Erickson, Chicago, assignor to First Trust and Savings Bank, trustee, Chicago, Ill. (Application filed July 31, 1906.) An improvement in central office circuits for use with the Strowger type of telephone, where the switches are controlled by currents over earthed circuits. The improved system provides a pair of condensers in the speaking circuit wires of the central office and relays having their windings on the calling side of the condensers, responding to earthed currents from the calling telephone, and repeating the signals as earthed circuits upon the other side of the condensers.

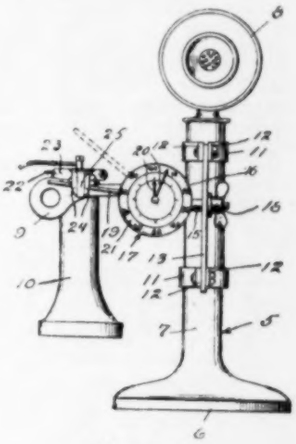
1,123,654. Attachment. Issued to G. J. Arfsten, Denver, Colo. A pad of sheets with a hole through the middle is attached to the telephone receiver. By pulling off the top sheet, a clean surface may be had against the ear.

1,123,695 and 1,123,696. Multiple Brush Selector. Issued to E. B. Craft, Hackensack, N. J., and J. N. Reynolds, Greenwich, Conn., assignors to Western Electric Company, New York, N. Y. In each of these patents a motor drives ten selecting brushes before a jackfield, and selecting mechanism renders only one of the ten brushes capable of making contact with the jack points.

*The review of patents this month covers only the patents issued in January, 1915. Patents issued prior to that time which we have not yet reviewed will be briefly covered in an early issue.

1,123,706. Multiple Brush Selector. Issued to A. F. Dixon, Newark, N. J., assignor to Western Electric Company, New York, N. Y. In a structure similar to that of the paragraph above, mechanism is provided to select one brush and move only that one.

1,123,734. Telephone Call Recorder. Issued to John K. Guthrie, Perth Road, Ontario, Canada, assignor of part to J. B. Heniger, Smith Falls, Ontario, Canada. A counter is attached by a clamp to the stem portion of the body of a



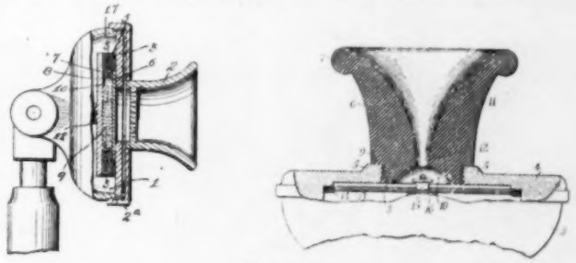
No. 1,123,734.

desk telephone. The operating lever of the counter projects beside the hook arm and is operated whenever the receiver is replaced upon the hook, thus counting the number of times the receiver is lifted and replaced.

1,123,799. Multiple Brush Selector. Issued to J. B. Reynolds, Greenwich, Conn., assignor to Western Electric Company, New York, N. Y. In the device of this patent, the several brushes are held out of operating position, and one of them is tripped and permitted to move into operating position.

1,123,826. Semi-Automatic Telephone System. Issued to H. G. Webster, Chicago, Ill., assignor to Kellogg Switchboard and Supply Company, Chicago, Ill. (Application filed Sept. 20, 1906.) The system provides for automatically connecting a calling line to a connecting plug before a manual operator.

1,124,021. Impulse Transmitter. Issued to W. F. Hoffmann, Springfield, Ohio, assignor to Western Electric Com-



No. 1,124,413.

pany, New York. (Application filed May 26, 1911.) An impulse transmitter or automatic telephone call sender, has a ring of buttons, by the depression of one of which a number of impulses are sent to the telephone line.

1,124,314. Automatic Switch. Issued to F. R. McBerty, Antwerp, Belgium, assignor to Western Electric Company, New York, N. Y. Brushes are moved by a motor over a field of stationary contacts, and a local circuit is provided, effective when the brushes are between contacts, and acting

to drive the brushes so that the brushes cannot stop between the contacts.

1,124,060. Test Guard for Automatic Switches. Issued to J. N. Reynolds, Greenwich, Conn., assignor to Western Electric Company, New York, N. Y. One motor is used to drive several automatic switches, and when the motor is driving one of the switches the remaining switches are caused to test busy.

1,124,105. Impulse Transmitter. Issued to W. M. Bruce, Jr., Urbana, Ohio, assignor to Western Electric Company, New York, N. Y. A device similar to that of patent 1,124,021, above, and having a lock such that a second button can not be operated until after the completion of the impulses to be sent by a first button.

1,124,401. Receiver. Issued to H. C. Egerton, Passaic, N. J., assignor to Western Electric Company, New York, N. Y. In a loud speaking receiver, the diaphragm is operated by the tip of a long arm whose base end is before the poles of the magnets.

1,124,413. Transmitter. Issued to Hugo Gernsback, New York, N. Y. Granular carbon held between a fixed plate and the direct diaphragm plate and surrounded by an insulating ring forms a very simple transmitter.

1,124,488. Semi-Mechanical Telephone System. Issued to F. R. McBerty, New Rochelle, N. Y., assignor to Western Electric Company, New York, N. Y. In setting a selective switch, the indicator is displaced by a predetermined measure, and the indicator is returned as the selective switch is moved, both movements stopping when the indicator is again normal.

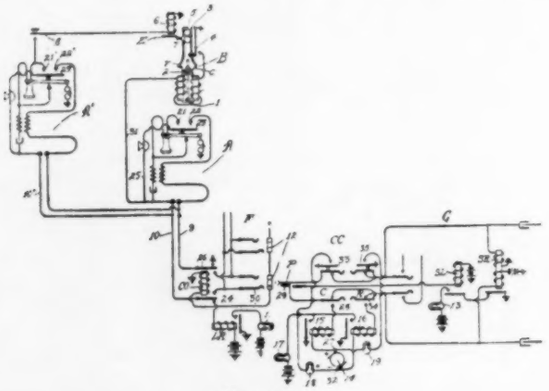
1.124,547. Mouthpiece for Transmitters. Issued to Louis Steinberger, New York, N. Y. The mouthpiece has a very much restricted passage near the diaphragm.

1,124,561. Coin Box. Issued to R. I. Utter, Chicago, Ill., assignor to Kellogg Switchboard and Supply Company, Chicago, Ill. Upon a telephone line with two telephones, one telephone is provided with a coin box, the device for passing the coin into the till being operable from either telephone.

1,124,608. Automatic Telephone System. Issued to Georg Grabe, Nikolassee, near Berlin, Germany, assignor to Siemens & Halske, A. G., Berlin, Germany. In an automatic switch, the fixed points are arranged in rows of more than ten points per row and a system of selection provides for getting auxiliary impulses for the selecting brushes so that points beyond the tenth may be reached by the brushes under control of a call sender which does not call higher than ten.

1,124,680. Selective Signaling Device. Issued to J. A. Wotton, Cranford, N. J., assignor to Western Electric Company, New York, N. Y. A step-by-step device for a telephone station, with driving and holding pawls and a contact arm, and quick and slow magnets for operating them.

1,125,273. Key Control for Automatic Switch. Issued to Amos F. Dixon, Newark, N. J., assignor to Western Electric Company, New York, N. Y. A "button bank" call sender, the depression of any button operating to adjust a selecting



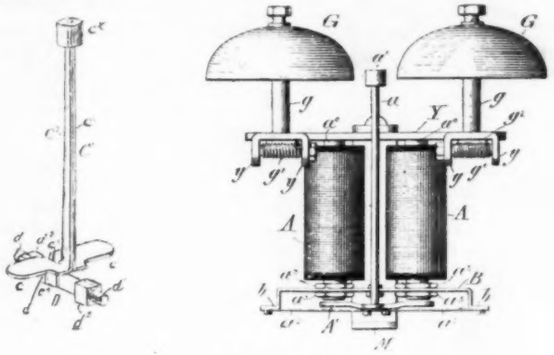
No. 1,124,561.

switch to a position corresponding to the number of the button pressed.

1,125,489 to 1,125,495. Ringer details. Issued to W. W. Dean, Elyria, Ohio; Curtis B. Cramp, trustee. (Applications filed in 1904 and 1905.) Improvements in harmonic selective ringers.

1,125,491. Protective Device. Issued to W. W. Dean, Elyria, Ohio; Curtis B. Camp, trustee. (Application filed May 19, 1905.) A single heat coil of two windings, one in each of the line wires, and operating to earth both wires.

1,125,579. Automatic Telephone System. Issued to Frank R. McBerty, New Rochelle, N. Y., assignor to Western Electric Company, New York, N. Y. The feature of improvement is the combination of test and release circuits by means of relays, that one connecting circuit wire operates first the test circuit and then the release of the automatic switch.



No. 1,125,490.

1,125,614. Telephone Lever Switch. Issued to John Whitaker, Philadelphia, Penna. This substitutes the hook for hanging up the receiver. A weight controlled by the receiver operates the switch of the telephone, and the receiver hangs on the cord.

1,125,682. Automatic Switch. Issued to Oscar F. Fosberg, Yonkers, N. Y., assignor to Western Electric Company, New York, N. Y. A selecting switch having a brush carriage with a number of brushes, and cams for holding the brushes normally inoperative.

1,125,764. Transmitter. Issued to C. C. Terhune, Platte, S. D. In a transmitter having an iron diaphragm, a permanent magnet holds the diaphragm under tension.

1,125,823. Silencer. Issued to F. Q. Dutton, Philadelphia, Penna. A close-fitting plug for the transmitter funnel.

1,125,832. Repeater System. Issued to J. W. Fry, Seattle, Wash. At each telephone is a key to be held closed while speaking. At the repeater station are relays controlled by the keys and converting the station apparatus into a one-way repeater in either direction, according to the identity of the closed key.

1,125,947. Indicator for Party Lines. Issued to E. Bowman, Elmwood, Ontario, Canada, assignor of part to C. R. Miller, Berlin, Canada. A vibrating tongue near the hook lever is struck by the lever when the receiver is lifted and the tone of the tongue is heard upon the telephone line; if the line is engaged, the parties speaking learn from the audible tone that a listener is upon the line.

1,125,954. Telephone System. Issued to S. H. Browne, Pittsburg, Penna., assignor to American Telephone and Telegraph Company, New York, N. Y. (Application filed Dec. 19, 1904.) A call-distributing system for manual exchanges, distributing the incoming calls among the operators.

1,125,965. Automatic Switching System. Issued to Edgar H. Clark, Austin, Ill., assignor to Western Electric Company, New York, N. Y. (Application filed Jan. 20, 1908.) A trunk extends between a main manual switchboard and a distributing point, and automatic connectors at the two ends of the trunk are arranged to move in unison, that the trunk at all times connects with the same line at its two ends.

1,125,997. Signaling System. Issued to J. C. Field, Orange, N. J., assignor to Western Electric Company, New York, N. Y. In a step-by-step selector, the driving magnet is polarized and the holding magnet not, a reversal of current operating the driving magnet, and current in either direction holding the ratchets until the selection has been accomplished and the currents finally broken.

1,126,007. Signaling Apparatus. Issued to F. B. Herzog, deceased; H. Herzog, executrix, New York, N. Y. (Application filed April 8, 1889.) A magnetically controlled wheel constructed to move forward by steps, with means for reversing the motion at successive points.

1,126,193. Springjack. Issued to O. M. Glunt, Rutherford, N. J., assignor to Western Electric Company, New York, N. Y. A jack body pressed from sheet metal has bottom and side flanges back of the thimble.

The Telephone Scrap Book

Curious and Useful Items, More or Less Telephonic, Gathered from Everywhere

Determining Heights in Line Work

WHEN using trigonometric methods for determining the height of an object it is always necessary to measure the base angle at the observer's eye between the top of the object and the ground line, says Allen N. Bancroft in *Electrical Review and Western Electrician*. An instrument of some sort must be used for measuring this angle. For ordinary work the home-made clinometer shown in Fig. 1 can be applied.

The simple angle-measuring device shown in Fig. 1 is constructed by fastening to a square wooden rod, about 18 inches long, a protractor. For a temporary tool, a cardboard protractor, that can be purchased for a few cents at a drafting-tool supply house, or can be readily drawn by anyone on a piece of Bristol board, can be used. The cardboard should be given a couple of coats of shellac to protect it from dirt or moisture. For a permanent tool a metal protractor should be used. Sights are arranged on the square wooden stick. The forward sight consists of a brass brad. The rear sight is the smallest brass screw-eye that can be obtained. Each of these is inserted about one-fourth inch from an end of the stick. In placing these sights in the stick, the maker should be careful to so drive them that the imaginary line of vision as shown in Fig. 1, when it passes through the center of the screw eye and the head of the brad, will lie exactly parallel with the diameter of the protractor. A piece of fine linen or silk fish line, having a metal weight or small plumb bob attached to its lower end, is tied loosely around a brad driven into the stick at the exact center of the protractor.

To read a base angle with this clinometer, the observer holds it in his left hand and shifts its position until his line of vision passes through the center of the rear sight and intersects the front sight and the top of the object, the height of which he wishes to determine. In sighting he uses only one eye and keeps the other one closed. When the clinometer is properly sighted he clamps the fish line with his thumb and first finger of his right hand into the position that it has now assumed on the index of the protractor, and brings the tool down to read it. The base angle will be indicated where the fish line lies against the scale of the protractor. By clamping the line against the protractor before taking it down, the line is retained in position so that an accurate reading can be made.

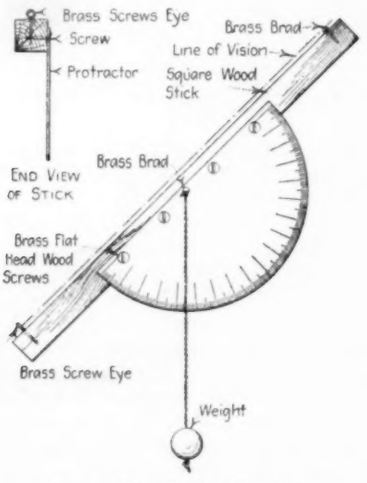


Fig. 1.—Home-Made Clinometer.

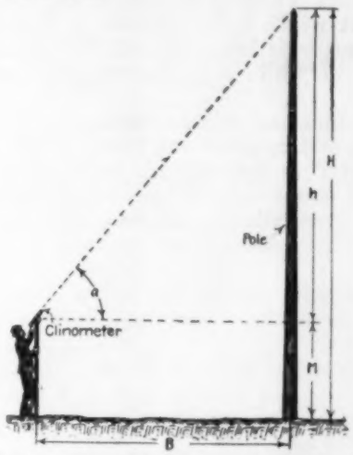


Fig. 2.—Determining the Height of an Object With the Clinometer.

The operation is as follows. The observer first measures (Fig. 2) some convenient distance, *B*, say 50 or 100 feet from the foot of the object. He then sights through the clinometer at the top of the object, and reads the base angle, *a*, from the protractor. Then the tangent, as taken from a table to be found in any engineer's handbook or other book of tables, multiplied by the base distance, *B*, plus the height of the observer, *M*, will give the height of the object.

Locating Bullets by Telephone

ACCORDING to Professor Violle, the Hughes induction balance is being successfully applied for the location of bullets and shell fragments in wounded soldiers. It may not be generally known that this marks a revival of an old-established and well-known application of a historical piece of apparatus, which should prove of inestimable value in the field in the absence of radiographic facilities, says *Electricity*.

The Hughes induction balance consists essentially of two pairs of coils, respectively primary and secondary windings. The coils of each pair are equal in magnetic effect, and in making up the balance they are paired as primary and secondary, the primaries and secondaries being respectively connected in series, but constituting separate and independent circuits.

In circuit with the primaries is a battery or other source of current and some form of interrupter, such as a buzzer or a microphone. The secondary coils are connected to a telephone receiver, and are so disposed in relation to the primaries that the induced currents generated in them by the current variations in the primary circuit exactly neutralize one another.

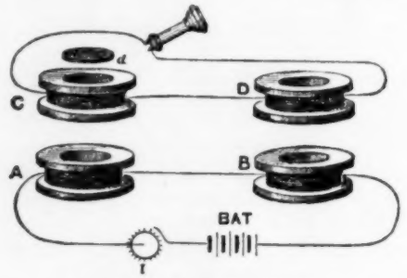
Under such circumstances the telephone receivers will be silent even while the primary circuit is active. If, now, one of the pairs of coils is brought near a mass of metal, the inductive balance is upset, and a sound will be heard in the receiver of magnitude varying with the mass of metal which produces it and its distance from the coils.

For use as a bullet locater, one pair of windings is made up as a traveling or "search" coil, and applied to various parts of the body in the vicinity of the wound. As soon as the coils approach the bullet, the telephone receiver commences to sound, and by careful manipulation a spot can be found, immediately over the bullet, where the sound is loudest. To detect the depth at which it lies hidden, a second bullet, of equivalent mass, is brought near the fixed coils of the balance until equilibrium is restored and the telephone silenced.

The distance of this second bullet from the fixed coils is then a measure of the depth to which the other has penetrated in the victim's body. The method is stated to be simple of application and very certain in its results. It entails no additional pain for the patient such as would ensue from the use of an ordinary probe.

The following description of the Hughes induction balance is from the Electrical Dictionary of Edwin J. Houston:

Hughes' induction balance is shown in the figure. *A*, *B*, *C*



Hughes Induction Balance.

and *D* are bobbins wound round with about three hundred feet of No. 32 copper wire. The coils are connected as shown, *A* and *B*, in the circuit of a battery, and *C* and *D* are placed at such a distance apart as to prevent any mutual induction occurring between them. The coils are so joined that the direction of the induction of *A*, on *C*, is opposite to that of *B*, on *D*.

The coils *A* and *B* then act as primaries, and *C* and *D* as secondaries. In the battery circuit is an interrupter, *I*, which is caused to continually make and break the circuit.

The coils are so adjusted that the opposing secondary coils produce but little noise to one listening at the telephone. This can readily be done by the adjusting of a single pair of coils.

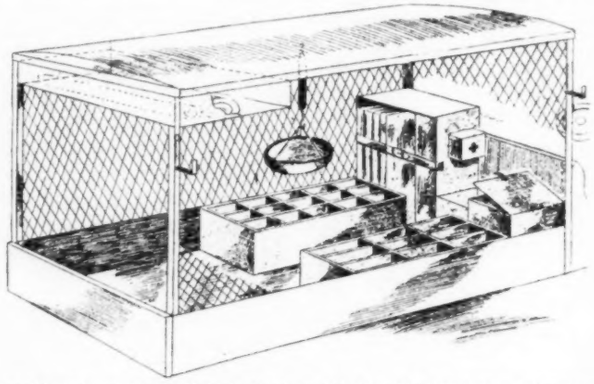
If a single coin or mass of metal be introduced between either *A* and *C*, or *B* and *D*, or even above one of the coils, as at *d*, the balance will be disturbed, since some of the induction is now expended in producing electric currents in the interposed metal, and a sound will therefore be heard in the telephone. But if precisely similar metals are placed in similar positions, between *A* and *C*, and *B* and *D*, no sound is heard in the telephone, since the inductive effects due to the two metals are the same.

The slightest difference, however, either in composition, size or position, destroys the balance, and causes a sound to be heard in the telephone.

A spurious coin is thus readily detected when compared with a genuine coin.

Special Motor Vehicles for Telephone Work

MOTOR vehicles have for some years been used as tower wagons in connection with the maintenance of overhead conductors. As, however, automobiles are becoming more generally employed for industrial and commercial purposes, the scope of their use by electrical engineers is also steadily extending. The New York Telephone Company, whose exchanges extend throughout New York, Brooklyn and the surrounding suburbs has in service a fleet of nine motor trucks designed for use in carrying material and equipment needed for making the necessary connections between a modern telephone switchboard installation and the conduit manholes in the streets. The vehicles are fitted with specially-designed bodies, the features of which are the low side boards and wire side screens. The length of the body is 8 feet 6 inches, the width 4 feet 4 inches, and the height 6 feet 4 inches. From the accompanying illustration it will be seen that the interior of the body is provided with several boxes, each of which is intended to carry some material used in connection with telephone installation work. At the forward left is a tall, narrow box, open on the side facing the rear. Several long thin strips of paraffin, which, when melted, are used in waterproofing cable joints, are carried in this box and are held therein by means of a leather strap. Directly to the rear of this box is located a long, shallow box, divided into several compartments by means of wooden partitions, and intended for the storage of small pipe fittings, such as elbows and nipples in which wires are carried over fences. In the front of the body, on the right, are two square



Special Body of Motor Vehicle Used by the New York Telephone Company.

boxes, in one of which is carried the lead used in wiping cable joints, while the other accommodates miscellaneous tools and the petrol stove used in melting the lead. Directly to the rear of this box is another long shallow one, divided into several compartments in which are carried the fittings used in switchboard installations.

Under the roof of the body, at the rear end, is a shallow box open at its front side, in which rolls of fireproofed canvas, used in the wrapping of cable joints, are carried. A spring balance, with a suspended pan, intended for weighing the amount of lead used, is hung from the center of the body top. For use in case of accident, a first-aid-to-the-injured kit, marked with a Geneva cross, is also provided, it being attached to the side of the box which holds the strips of paraffin. On the outside of each of the four roof posts is a U-shaped iron bracket used for the carrying of ladders, lengths of pipe, sump pumps and coils of rope.

Senator E. F. Ackley has introduced a bill in the Wisconsin legislature prohibiting the collection of telephone rentals in advance. It is expected that many telephone companies will contest this issue.

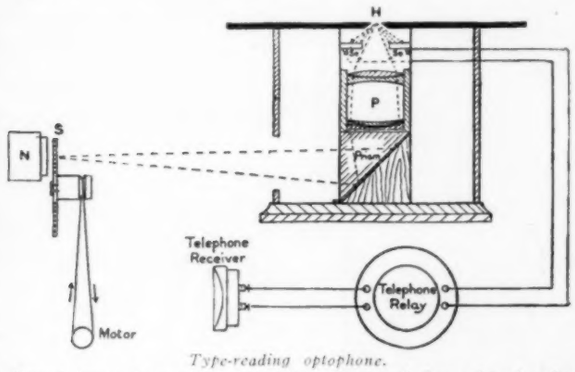
The Type-Reading Optophone

ANY instrument designed for translating optical into acoustic effects, or light into sound, and thus to some extent substituting the ear for the eye, may be appropriately termed an "optophone." The intermediate link is either heat or electric current, and in view of the fact that a current of a few thousandths of a microampere is audible in the best modern telephones (if intermittent), one would naturally use an electrical rather than a thermal link. This is done in the various forms of "optophone" devised by the author since the Optical Convention of 1912, says E. E. Fournier d'Albe in *Nature*.

The latest of these, described before the Royal Society on May 28, and shown at the conversazione of the society on June 16, is designed with the object of enabling blind persons to "read" ordinary letterpress by means of the ear. The accompanying illustration of the optical arrangement is reproduced from the Royal Society paper by permission of the council.

An optical system throws the image of a glowing Nernst filament upon the printed paper, laid face downward on a suitably perforated desk. This image is broken up into a series of seven or eight luminous dots, flashing with different musical frequencies, by means of a rotating siren placed immediately in front of the Nernst filament. Some light-sensitive preparation, preferably of selenium, is placed close to the type so as to receive whatever light is diffusely reflected by it. The size of the image is made to fit the kind of type to be read, and a sensitive telephone is put in series with the selenium and a battery with one of S. G. Brown's telephone relays.

It has been found possible to obtain an "audible" sound from type of the ordinary newspaper size. The straight black stem of a letter produces silence, and a



Type-reading optophone.

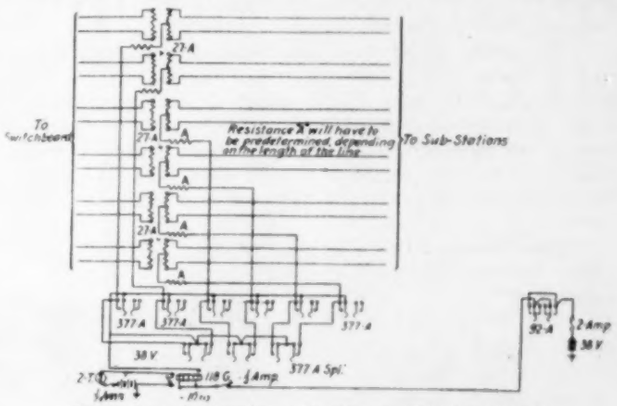
N, Nernst lamp; S rotating siren disk; P, portrait lens, throwing image of line of intermittent dots on the printed matter placed face downward at H; Se, selenium preparation receiving diffusely reflected light.

curved letter, such as S, produces in its passage a set of gradually changing notes which are characteristic of the letter, and cannot be mistaken even after only a few minutes' practice. To learn the entire alphabet in this way should be a matter of a few weeks or months, but the amount of practice required will vary very greatly from one person to another, as only a "musical" ear can readily detect the omission of certain notes from a given chord. Given an adequate alinement and line-changing mechanism, there is no reason why, with sufficient practice, ear-reading should not be almost as rapid as ordinary reading at sight.

The choice of type is, of course, unlimited. There is no arbitrary element in the determination of the sounds required to represent the various letters, as each type will automatically produce its own characteristic sounds. With considerable practice, a blind person, thus trained to allocate certain notes to certain positions, should be able to construct "instinctively" a visual (or tactile) image of any new or unfamiliar letterpress type at the first hearing.

Standby Signals Over Telephone Circuits

THE Edison Electric Illuminating Company of Brooklyn has entered into an agreement with the New York Telephone Company to transmit standby signals from its system operator's office to various substations,



Connection of Signaling Apparatus to Telephone Lines.

according to the *Electrical World*. Disturbance to telephonic communications over these circuits is prevented by connecting the signal wires to the middle of coils bridged across the telephone circuits. Single-stroke bells operated by direct current are employed to give the signals. Each station is signaled from its respective key on the system operator's switchboard, which is arranged, however, so that all of the stations can be signaled simultaneously, individually or in groups.

Signals transmitted over this system are intended to notify the operator of the time when storage batteries must be charged and when to make ready for operating equipment. During the time which the system has been in use signals have been transmitted satisfactorily. The testing of the telephone circuits has caused false signals to be transmitted, but this has been the only thing to detract from the successful use of the method.

The Telephone for Making Probes

In the *British Medical Journal*, Sir J. Mackenzie Davidson points out the difficulty of acurately localizing a bullet or other foreign body with the x-rays, unless stereoscopic x-ray photography is employed. On the other hand, he states that the telephone can be advantageously used for this purpose by connecting one terminal to a moistened electrode which is applied to the patient's skin, and the other terminal firmly to a metallic instrument such as a probe or forceps. Directly the probe touches metal embedded in the tissues, a grating sound is heard in the telephone, because of the voltaic cell thus formed. This method, especially when employed in conjunction with stereoscopic photography, greatly reduces the time occupied in the search and the disturbance to the patient's tissues. On the other hand, it is stated that in modern warfare the removal of bullets from the body is not very necessary, as their presence is usually without harmful effects.

Of Interest to the Trade

What the Telephone and Accessory Manufacturers Are Doing to Advance the Art

Sales Field Has a New Figure

Harmon A. Harris, who recently assumed active charge of the sales department of Automatic Electric Company, of Chicago, under the title of vice-president and sales manager, is a prominent member of that group of younger men who are making their influence so strongly felt in the telephone field today.

The entrance of these men into an active participation in the conduct of the telephone business of America has introduced a new factor which is certain to have a large effect upon this industry. There was a time, and that not so long ago, when many of those who were dominant in American telephony were men who had started life as doctors, lawyers, professional and business men of every sort.

They entered the telephone field by accident, rather than from deliberate choice or design.

The problems they faced were unformulated, dimly perceived, and those who undertook to solve them had no experience as a guide. They proceeded by rule of thumb, applying to the new questions that arose old precepts learned in their former pursuits. That these pioneers have done wonderfully well, that they have builded better than they knew, is recognized by all, and the debt American telephony owes them can never be estimated.

But these new men come to their tasks under different circumstances. They approach them with a different attitude. Behind them is the experience of those who have gone before, a heritage of great value. They are no longer stepping forward, cautiously, into unexplored regions. Their problems have been broadly outlined; the solutions of many of the questions have been indicated, if not actually achieved.

Harmon A. Harris, Vice-President and Sales Manager of Automatic Electric Company.

The younger generation are undertaking the burdens of the telephone business trained for their work. They have a keen appreciation of the magnitude of the industry they are engaged in. The pioneers were constantly startled by the gigantic strides made by the business they were promoting. Their successors are surprised at nothing, but have a clear perception of the possibilities before them and an abounding faith in the work to which they are giving their energies. They have entered the telephone field deliberately, as careers to be prepared for and followed as sedulously as the older professions, and not as a chance venture.

In a literal sense, as well as figuratively, Harmon A. Harris is of this second generation, for he is the son of Joseph Harris, founder and president of Automatic Electric Company. Mr. Harris, Jr., was reared in an atmosphere in which the telephone was a dominant factor. He has, in truth, "grown up with the business." It has been with him since his boyhood.

It is not remarkable, therefore, that although a comparatively young man, Mr. Harris brings to his new duties an experience and training which is wide and varied. He was born in Chicago, February 21, 1878, and was educated in the public schools of Chicago, and the University of Michigan. In this way he received not only the fundamental elements of a liberal education, but also pursued such studies, commercial and scientific, as would serve him best in his future career.

Mr. Harris first entered the telephone field 15 years ago, becoming actively associated with Automatic Electric Company. His connection with that company began as purchasing agent. Since that time he has devoted his energies exclusively to telephone matters from various angles. Mr. Harris was elected vice-president and director of Automatic Electric Company in 1905, and for several years kept in close touch with the manufacturing departments of the organization. For some time past he has devoted considerable attention to sales problems, and his assuming of the active direction of this department comes as an extension of these activities, rather than as a launching out into a new career.

In addition to his connection with the telephone business on the manufacturing side, Mr. Harris has been closely identified with its operating problems. He has been vice-president and director of the South Bend Home Telephone Company, and has financial interests in several other companies in the operating field.

In consequence of this training and experience, Mr. Harris comes to his new position well equipped for his tasks. He has a thorough knowledge of the products of his firm, being familiar with the material which enters into it, with the various steps in its manufacture, and his faith in automatic equipment, fortified by long years of observation of its performance, is unbounded. Add to this the fact that he has made a comprehensive study of telephone operation, both as a business problem and as a public utility, and it becomes clear that he is in a position not merely to extend to those with whom he will have dealings, the courtesies customary in business trans-

actions, but is able to meet them upon a basis of comprehension and understanding.

Kellogg at the National Conventions

The past month has been a busy one for the Kellogg Switchboard & Supply Company's representatives. At both the Minneapolis and Chicago conventions throngs of telephone men visited the Kellogg exhibit rooms to see the wonderful big automatic recall switchboard in operation, with its great time and money saving features of automatic listening and ringing, instantaneous disconnect and recall, secret service and automatic peg count.

Standard types of apparatus arranged in comprehensive display on permanent exhibit panels together with a 150-line magneto board, pole changers, a new type tall

Exhibit of Kellogg Equipment.

test panel, the various electrical signs and framed display cards composed the rest of the exhibit.

At Minneapolis a very unique litle booklet was circulated, which was made up in the style of the usual telephone directory. This was printed in gray ink on buff stock and consisted of eight pages, containing the convention program, map of the business district, list of attractions at the theatre for the week, and a short but instructive article on "directory building."

Both at Minneapolis and Chicago, the January issue of *Telephone Facts*, the Kellogg Switchboard & Supply Company's house organ, were distributed among the visitors. Of special note in this issue was the white eight-page insert bearing the portraits of Kellogg officials and representatives who are more or less in contact with the trade, and a reproduction of the fine new building, which this company will occupy shortly.

Kellogg officials and representatives at Minneapolis were L. D. Kellogg, president; A. J. Carter, general sales manager; H. D. Currier, chief engineer; E. G. Lawrence, Minnesota representative; C. C. Huffman, Wisconsin representative; G. H. Crandall, Illinois representative; O. F. Cassaday, sales engineer; F. L. Eldridge, sales representative; Edward I. Pratt, advertising manager, and Fred Seeley, sales representative.

At Chicago the following were present:

L. D. Kellogg, president; J. B. Edwards, vice-president and general manager; J. G. Kellogg, vice-president; A. J. Carter, general sales manager; H. D. Currier, chief engineer; H. A. White, Kansas City office; Ben Woodbury, Ohio representative; T. L. Dunlap, Missouri representative; J. A. Campbell, Indiana representative; B. H. Blake, Indiana representative; G. H. Crandall, Illinois representative; H. B. Dudley, Michigan representative; C. C. Huffman, Wisconsin representative; W. R. Hind, Iowa representative; W. S. Boze, Iowa representative; Fred Seeley, sales representative; O. F. Cassaday, sales engineer; C. D. Boyd, sales engineer; F. L. Eldridge, sales representative; E. A. Woodward, railway sales engineer; C. M. Bowling, Illinois and Indiana representative; E. G. Lawrence, Minnesota representative; L. R. Foote, Nebraska representative; S. M. Lewis, southern representative; Edward I. Pratt, advertising manager; W. C. Swain, advertising department; M. B. Stazek, W. R. Brewer, G. W. Peck, Jr., D. J. Gillespie, A. D. Boal.

Exhibits at the National Convention

More than fifty manufacturers and supply dealers were represented by exhibits at the convention of the National Independent Telephone Association, held in Chicago, February 3, 4 and 5.

The entire seventeenth floor of the Hotel La Salle was devoted to the exhibitors and the display was probably the most interesting ever viewed at any telephone convention ever held in Chicago.

The "old time" spirit prevailed during the entire convention. The exhibit rooms were constantly flooded with guests in search of new and interesting improvements in telephone and accessory apparatus. Souvenirs and literature were in abundance and in one instance "large red Baldwins" were enjoyed by all. The companies which exhibited were as follows:

Addressograph Company, Chicago, displayed two models of its addressograph machines: a motor driven and also a small hand type. The motor driven type was explained as being exceptionally appropriate for smaller telephone companies. The standard motor driven type is claimed to be capable of filling out telephone bills at the rate of 2,500 to 3,500 per hour. A. B. Dygert, manager of the system service department, represented the company's exhibit.

Adsit General Electric Company, Minneapolis, exhibited its popular lockout device which was thoroughly explained by F. W. Adsit and C. D. Enochs. Many questions were answered by the representatives and the exhibit proved of much interest.

American Electric Company, Chicago, displayed a complete line of switchboard and telephone apparatus including a new receiver. P. C. Burns, L. G. Le Bourveau, L. E. Smith, F. B. Boice, W. T. Curtis, J. Russell and E. L. Brown were in charge of the exhibit.

American Telephone Fire Alarm Company, Chicago, with an entire display of telephone fire alarm apparatus for manual and automatic systems was represented by C. P. Peel and S. Klusat.

Julius Andrae & Sons, Milwaukee, Wis., represented by M. H. Croswell, exhibited a Burns magnetoboard with Andrae drops.

Automatic Electric Company, Chicago, presented to the convention guests a complete exhibit showing an installation of automatic equipment for rural lines. This equipment eliminates the necessity of operators and furnishes absolute service constantly. Automatic equipment for city service was also exhibited and the three display rooms were a busy scene of telephone men. The cordless P. B. X. switchboard and a full line of Raven Brand cords, wires, cables, condensers and many other accessories were of much interest to the spectators. The huge display was represented by Messrs. Harris, Critchfield, Benoist, Mellinger, Owens, Curtis, Thompson, Finley, Hirsch and Bennett.

Automatic Time Stamp Company, Boston, Mass., was represented by H. W. Nickel and F. X. Mayer, who explained their timeometer for registering overtime on long distance calls. Included in the exhibit was a new envelope sealer which is claimed will seal and count 60,000 envelopes per hour.

Cameron Appliance Company, Everett, Mass., in charge of J. K. Bovard, exhibited metal cable hangers and a Cameron pole changer. Match safes were presented as souvenirs.

Coffey System & Audit Company, Indianapolis, Ind., showed many forms of accounting systems in accordance with the Interstate Commerce Commission's schedule. J. W. Coffey represented the display.

Frank B. Cook Company, Chicago, was represented by Messrs. Moore, Roder, Newburn, Cook, Tompkins and Corwin, who explained the features of the Corwin semi-automatic system. Literature was presented on the Cook installation at Fort Wayne.

C. E. Cox Lightning Arrester Company, Eaton, Ohio, showed a multiple lightning arrester, demonstrated by C. E. Cox and W. F. Cox.

Cracraft-Leich Electric Company, Genoa, Ill., exhibited a complete line of telephone instruments consisting of the Automophone for magneto service, farm line sets and common battery instruments. A 300-line magneto switchboard equipped with restoring drops proved of much interest. Messrs. McNutt, Nelson, Hogue, Leich, Kohn, Reid, Gullion, Meyers and Kepner.

Delta Electric Company, Marion, Ind., were represented by G. C. Dent and A. E. Case, who demonstrated the Delta secret service telephone system, pay station and electric flash lamps.

Electric Storage Battery Company, Philadelphia, Pa., represented by G. H. Atkin, T. Milton and Messrs. Downdon, Cressy, Beck and Rebel, described the uses of storage batteries and insulators for placing under storage batteries. Interesting literature on batteries for telephone service was distributed.

Everstick Anchor Company, St. Louis, Mo., demonstrated the Everstick and Cone anchors, cable clamps and cable hangers. Jasper Blackburn was in charge.

Fibre Conduit Company, Orangeburg, N. Y., with a standard line of underground conduit and fittings, was represented by W. W. Smythe, Jr., and F. C. Smith.

Garford Manufacturing Company, Elyria, Ohio, displayed a very interesting line of common battery and magneto switchboards, telephones, etc. A phantom circuit equipped with Garford phantom coils caused considerable interest. The Garford transmitter was also on exhibition. Included among the representatives were A. G. Bean, H. L. Harris and G. A. Joy.

Gund Manufacturing Company, La Crosse, Wis., showed the various positions of D. & T. anchors during driving and setting operations. The company's new guy clamp and also the two-ball adjuster for electric lights were demonstrated by C. R. Pieper.

Holtzer-Cabot Electric Company, Brookline, Mass., represented by C. I. Hickman and Messrs. Lenz, Hall and Klunder, exhibited a full line of telephone parts and magneto apparatus; a pole changer and motor generator.

Illinois Electric Company, Chicago, with an extensive display of electrical supplies and apparatus, construction tools, Pyrene fire extinguishers, Westinghouse fans, steel tape and Klein's tools, was represented by R. Kennedy and J. A. Duncan.

Indiana Steel & Wire Company, Muncie, Ind., showed a coil of No. 12 B. B. galvanized iron wire, demonstrating its durability by twisting and stretching tests. "Bob" Miller, the company's sales manager, presented large red apples and a wire coin holder to guests visiting the exhibit.

International Harvester Company, Chicago, was represented by L. Barnabas and C. E. Johnson, who presented guests with literature on the company's motor trucks for telephone work. Photographs were used in demonstrating the various uses of the motor truck in telephone construction work.

H. W. Johns-Manville Company, New York, displayed its insulated fibre conduit, transite, Niagrite, fuses, rubber tapes, asbestos blankets and dry cells. The display was in charge of H. M. Frantz.

Kellogg Switchboard & Supply Company, Chicago, presented a splendid exhibit. Practically every visitor made a special investigation of the big automatic recall switchboard in operation. Included in the company's exhibit also were a 150-line magneto board, pole changers and a new test panel. The exhibit was represented by A. J. Carter, H. N. Faris, B. Woodbury, C. Pruitt, C. M. Bowling, B. H. Blake, W. S. Boze, F. Seeley, C. D. Boyd, C. C. Huffman, W. R. Hind, H. B. Dudley, E. G. Lawrence and G. H. Crandall.

Mathias Klein & Sons, Chicago, featured an interesting line of electricians' tools, Klein clamps, long nosed pliers, the Chicago grip and a complete set of linemen's tools were on exhibit. The Wasson reel and the new Klein Staysalite lineman's torch was demonstrated by P. W. Yerbst and J. M. Klein.

W. N. Matthews & Bro., St. Louis, Mo., represented by C. L. Matthews, M. J. Wolf and Messrs. Bischoff and Bakewell, explained the various money saving features of Matthews specialties as exhibited on a miniature pole line.

Monarch Telephone Manufacturing Company, Fort Dodge Iowa, featured a complete line of telephone and switchboard equipment, including a 200-line desk type switchboard and the Monarch recall system for switchboards. Among the representatives were Messrs. Trimm, Trumbull, Wilson, Moulder and Merriam.

National Carbon Company, Cleveland, Ohio, showed various types of Columbia dry batteries. Messrs. Fisher, O'Connor, Wilkins, Ward and Myers explained the company's specialties.

Naugle Pole & Tie Company, Chicago, showed various sections of poles, treated with C-A wood preserver. Sections of poles were also on display showing the size and quality of the stock kept on hand by the company in its Chicago yards.

Nungesser Carbon & Battery Company, Cleveland, Ohio, displayed various grades of carbon materials from a large sample board. Included in the exhibit were two dry cells which had been in service for six and one-half years. T. D. Grier, H. S. Greene and Messrs. Briggs, Jones and Robinson were in attendance.

Page & Hill Company, Minneapolis, Minn., featured a full line of cedar products and many samples of treated poles. Interesting photographs were also shown of the company's plant at Minneapolis.

Phono-Print Company, Defiance, Ohio, presented forms for keeping books in accordance with the Interstate Commerce Com-

mission schedule. Tickets and forms for other purposes were also shown and explained by J. A. Deindoerfer, Jr.

RAND COMPANY, North Tonawanda, N. Y., featured a visible index for the information desk; capacity ranging from 50 to 30,000 names. The exhibit was in charge of W. C. Hamilton.

RELIABLE ELECTRIC COMPANY, Chicago, displayed the Davidson zinc cable hanger, Litearm, cable terminals lightning arresters and fuses. Messrs. Cook, Junge and Rodormer represented the company.

JOHN A. ROEBLING'S SONS COMPANY, Trenton, N. J., were represented by A. D. Harrison and W. H. Slingluff, who distributed souvenir calendars and pencils.

RUNZEL-LENZ ELECTRIC MANUFACTURING COMPANY, Chicago, was represented by J. M. Lenz.

SPARTA MANUFACTURING COMPANY, South Bend, Ind., featured water stills for purifying water for storage battery use. L. E. Single explained the various features of the apparatus.

STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, Rochester, N. Y., had a very comprehensive display of telephone apparatus, including the steel wall telephone for hotels, combination telephone, the desk stand and the oak cabinet wall and residence type of intercommunicating apparatus, private line telephones, a 30-line capacity switchboard, a desk type board, a small cordless type switchboard for private branch exchanges and the compact type magneto telephone were all included in this interesting exhibit. Among the company's specialties were the Call-a-phone, Telodetective and the Mine-a-phone. The company was represented by Messrs. McCanne, Reinke, Van Vleet, assisted by Messrs. Haubrich, Redmond, La Fleur, Schafer, Horn, Johnson, McCarty, Stigberg, Kalhous and many representatives from various other cities.

STANDARD UNDERGROUND CABLE COMPANY, Pittsburgh, Pa., and Chicago, were represented by the Chicago office.

STEWART BROTHERS, Ottawa, Ill., interested the visitors with a section of a telephone line used to demonstrate the working of Stewart test sets and cable tester. The resistance meter was demonstrated by means of an artificial line. Stewart and Stewart explained the features of the exhibit.

SWEDISH-AMERICAN TELEPHONE MANUFACTURING COMPANY, Chicago, showed a complete line of magneto switchboards and telephone apparatus. A 150-line switchboard, equipped for 60 lines, was a center of interest to the visitors. The board provided double supervision and had 15 cord circuits. Peerless and Hercules telephone sets and the company's regular line of construction materials were explained by F. W. Pardee, L. Sipperby and E. F. McCord.

TELEPHONE ENGINEER, Chicago, was represented by Ed J. Mock, Paul H. Woodruff, Allen L. Haase and Fred B. Schafer.

TELEPHONE PRINTING COMPANY, Defiance, Ohio., was represented by T. E. Carr, who explained the various forms of vouchers, checks and bookkeeping accounts in accordance with the systems fixed by the Interstate Commerce Commission.

TELEPHONY PUBLISHING COMPANY, Chicago, was represented by H. B. McMeal, J. C. Kelsey, S. R. Edwards and J. R. Hastie.

THOMPSON-LEAVERING COMPANY, Philadelphia, Pa., exhibited an interesting testing set, the Peerless proportional test set for locating crosses and grounds, and other types of testing sets and measuring instruments, including the Peerless switch dial set, plug type test set, Peerless fault finder, Peerless government standard set, standard A T & T toll test board, Peerless galvanometer and the Wheatstone bridge. W. J. Thompson was in charge.

UNION ELECTRIC COMPANY, Abilene, Kans., featured the Berry portable test set for locating grounds, crosses and shorts. J. J. Berry, the inventor, explained the fine points of the apparatus.

UTILITIES INDEMNITY EXCHANGE, St. Louis, Mo., was represented by T. Block and B. H. Hatte, who explained the company's plan of carrying liability insurance of those in the telephone industry.

VALENTINE-CLARK COMPANY, Minneapolis, Minn., presented specimens showing the various degrees of preservation of Northern and Western cedar poles. Photographs and descriptive literature was explained by Messrs. Furlong and Navarre.

VOLUNTEER FIREMEN'S SIGNAL COMPANY, Minneapolis, Minn., featured its rotary automatic fire alarm, designed for use in small towns where volunteer fire departments are located; also for hotels and factories. The company's president, O. H. Tracy, demonstrated.

WHITE COMPANY, Cleveland, Ohio, explained the features of White motor trucks for telephone construction work. F. H. Williams presented interesting photographs and figures illustrating installations operating successfully.

Frank B. Cook Maintains a Reputation

Frank B. Cook, Chicago, Ill., enjoys the novel reputation of always obtaining the winning end of a lawsuit. Further, it seems as though he is one of the few men who find it possible to make as much money out of litigation as the lawyers, if not more.

He has just won a notable victory in a decision recently rendered by Judge Rose, sitting in the United States District Court of New York, in a case involving a very considerable number of patents which control largely the prevailing fire alarm and sprinkler systems, in which case the defendants numbered, among others, the Automatic Fire Protection Company, the Fire Protection and Development Company, and the parent American District Telegraph Company.

On this case, which is quite ancient, dating back to 1903, Mr. Cook has, we are informed, spent a small fortune in its prosecution, and, considering the age of the case, together with the amount of time and money Mr. Cook has devoted to it, there seems to be little doubt as to the merit of the reputation he enjoys, namely, that once he starts legal proceedings, he doesn't desist until every possible expedient has been exhausted.

In this particular case, the decision above mentioned is wholly in Mr. Cook's favor and the accounting which the court has ordered will, it is estimated, result in an award to Mr. Cook that will approximate $500,000, and, again, on account of the age of the case, the payment of this award cannot, according to Mr. Cook's attorneys, be prolonged beyond one year from the date of the decision.

Automatic Operating Men Hold Chicago Conference

Eighteen telephone companies operating automatic equipment and having in service an aggregate of 350,000 telephones, were represented at a conference held at the factory of Automatic Electric Company, Chicago, on Friday and Saturday, February 5 and 6. Forty delegates were present, and a very interesting program of papers and discussions was carried out.

The occasion was the regular February session of the Ohio Automatic Telephone Association, comprising the companies operating automatic exchanges in Akron, Bucyrus, Cambridge, Columbus, Dayton, Kenton, Newark, St. Marys and Van Wert, Ohio, and Richmond, Indiana. This organization, which was formed nearly three years ago, has for its object the interchange of ideas among those engaged in the operation of automatic telephone equipment and the success and the value of the association has exceeded the most sanguine expectations of its founders. Regular meetings are held throughout the year, each exchange of the member companies being visited approximately every twelve months. At each session the report of a committee appointed for the purpose of inspecting the plant visited is read and discussed. The methods in vogue in the exchanges are commented upon and much helpful criticism is brought out. Some technical subject pertaining to automatic operation is discussed at each meeting, and the experience and progress of each individual is thus made available to all members.

Automatic Electric Company, which is also a member of the Ohio Association, acts as host to the organization for one of these meetings each year, and special invitations are extended to all companies operating automatic equipment to have representatives present at these

annual conventions. The program followed at the recent session in Chicago conformed closely to those of the regular meetings, and comprised papers on various important topics and their discussion together with an inspection of the factory by committees of visiting operating men.

The convention covered two days, the morning of the first being devoted to the factory inspection, and the balance of the time was given over to papers and discussions. The more serious business of the convention was interrupted Friday night when the visitors were the guests of Automatic Electric Company at a theater party at the Illinois, where "Sari" was witnessed, during which Miss Hajos, the leading lady, and Mr. Gilbert, the comedian, very cleverly injected a reference to the automatic dial into their lines as a compliment to the telephone men present. Luncheon was also served by the company between the morning and afternoon sessions on Saturday. The program was as follows:

Friday morning—Inspection of factory by committees appointed by the Ohio Automatic Telephone Association.

Friday afternoon—Standardized Nomenclature; List of Standard Expressions Used in Automatic Plants, by Roy Owens, Automatic Electric Company, followed by a general discussion.

Demonstration and Paper on Automatic Rural Line Equipment, by B. D. Willis, Automatic Electric Company. The discussion was led by Guy Watkins, Newark, Ohio; C. A. Swoyer, Columbus, Ohio, and B. H. Collins, Grand Rapids, Michigan.

Transmission Losses in Various Circuit Combinations, Practical and Theoretical, by Arthur Bessey Smith, Automatic Electric Company. The discussion was led by A. J. Seymour of St. Paul, Minn.

Multi-Office Installation of Automatic Equipment and Gradual Change to Full Automatic, by Bernard C. Groh, Automatic Electric Company. The discussion was led by Fred L. Baer, Automatic Electric Company, who explained interesting features in connection with the Sydney, Australia, cut-over. A letter from Leo Keller of the Home Telephone Company, Los Angeles, told of the experiences of that company in cutting over its exchanges.

Saturday morning—Automatic Equipment in Foreign Governmental Exchanges, by E. A. Mellinger, Automatic Electric Company, followed by a general discussion.

Report of the inspecting committee and discussions on its report. This feature of the program was of particular value, as it brought to those engaged in the manufacture of automatic equipment the ideas of the men who operate that apparatus.

Saturday afternoon—Demonstration and Description of Long Distance Automatic Calling and Switching of Toll Lines, by John Wicks, Automatic Electric Company. The discussion was led by James E. Mooney of Grand Rapids, F. B. Moody, Columbus, Ohio, and C. A. Torrey, South Bend, Ind.

Automatic Private Branch Exchanges and Private Automatic Switchboards, by J. H. Finley, Automatic Electric Company. The discussion was led by E. D. Talbot of Buffalo, N. Y.

As will be noted, the subjects chosen for consideration were very timely and practical and it was felt that all who took part in the meeting derived great benefit from them. The most remarkable feature of this convention, however, was the close and harmonious relations thus revealed as existing between Automatic Electric Company and the companies operating the equipment manufactured by that organization, and it is believed that an even fuller mutual understanding of the problems confronting the makers and users of automatic equipment will result from this conference.

The following is a list of those present from automatic exchanges: W. C. Ballinger and T. G. Snyder, Ohio State Telephone Company, Akron, Ohio; H. O. Dutter, Bucyrus Telephone Company, Bucyrus, Ohio; E. D. Talbot, Federal Telephone and Telegraph Company, Buffalo, N. Y.; R. A. McBride, Cambridge Home Telephone Company, Cambridge, Ohio; K. W. Fort, C. M. Waggoner and R. B. McCowan, Illinois Telephone and Telegraph Company, Chicago; Gansey R. Johnston, F. B. Moody, C. A. Swoyer, W. A. Shoemaker, G. H. Palmer, C. M. Balbert and C. O. Grace, Ohio State Telephone Company, Columbus, Ohio; A. W. Surrell and R. A. Folsom, Ohio State Telephone Company, Dayton, Ohio; F. L. Fisher, Decatur Home Telephone Company, Decatur, Ill.; J. E. Mooney and H. I. Collins, Citizens' Telephone Company, Grand Rapids, Mich.; R. L. Barry, A. J. Seymour, A. C. Cragg, W. H. Roll, A. O. Knell and C. A. Beliveau, Tri-State Telephone and Telegraph Company, St. Paul, Minn.; C. E. Hollander and Guy Watkins, Newark Telephone Company, Newark, Ohio; W. M. Bailey and B. J. Anderson, Home Telephone Company, Richmond, Indiana; George H. Davis, Rushville Co-Operative Telephone Company, Rushville, Ind.; James A. Rae, Sioux City Telephone Company, Sioux City, Iowa; E. E. Daicey, C. A. Torrey, J. R. Mercer and F. R. Montague, South Bend Home Telephone Company, South Bend, Indiana; R. K. Judy, St. Marys Telephone Company, St. Marys, Ohio; J. W. Longwell and Fred J. Grupp, Van Wert Telephone Company, Van Wert, Ohio; H. Heineman, H. I. Crawford, Wausau Telephone Company, Wausau, Wisconsin.

Union City, Indiana, Installs Stromberg Equipment

The Union City Home Telephone Company, which operates in Union City, Indiana, and surrounding territory, last month successfully cut into service an up-to-date common battery switchboard and is now rendering a grade of service to its patrons which is second to none. In the new operating room the initial installation comprises two switchboard sections of three positions and six panels each. The woodwork is of quartered oak with the serviceable dull golden finish which is so largely displacing the high varnish finish on modern multiple boards. Eight hundred subscribers' lines of the three-wire multiple double cut off relay type are provided for the local service. Desiring a board which could be operated economically, and at the same time maintaining a rapid fire service, the telephone company required, among other features, that the subscribers' multiple should appear every four panels, instead of six as might be anticipated upon six panel sections. In the four panels an ultimate of two thousand subscribers' multiple lines may be installed, and also eighty outgoing trunk circuits. With this distribution of the multiple any operator may complete a connection by reaching not to exceed one panel to the right or left of her position unless occupying an extreme end position. The four panel multiple, moreover, allows use to be made of the end positions, which otherwise would serve only for multiple annex purposes. The first position is equipped for night toll service, having twenty plug restoring tubular drops and five universal cord circuits.

Ten plug ended toll switching trunks also terminate in this position and are served by the adjacent operator

during the day. Sixty plug restoring drops and eighteen universal cord circuits appear in the second or rural position. Each of the remaining four positions contain two hundred regular subscribers' answering jacks with lamp signals and fifteen cord circuits. The subscribers' cord circuits are each equipped with individual party line keys and circuit features characteristic of late approved switchboard practice. All key mountings, including a strip of eight order wire keys per position, are sunk flush with the keyboard surface, and supported upon steel keyframes. Twenty local outgoing trunk circuits are multipled throughout the board, connecting with the chief operator's and wire chief's desks, and the toll switchboard for recording purposes.

In front of the subscribers' board is located the chief operator's desk. The various pilot, service observing and trunk circuits terminate in lamps and keys mounted upon flush steel mounting strips in the face of the turret. The desk surface is left entirely clear for clerical work.

A wire chief's desk, uniform in general design with the chief operator's, was installed in the terminal room.

During the day toll service is handled at a special two position toll board, of which a view is also presented. In the outer panels appear the plug restoring toll drops with associated designation strips and switching keys for transferring the toll circuits to the subscribers' board during the hours of light traffic. The recording trunks and toll service trunks from the subscribers' board terminate in the two middle panels where accessible to either operator. Deep key shelves furnish ample room for toll ticket work and space for the Calculagraph between the positions.

Completing the new equipment may be mentioned the distributing frame with No. 10 Cook protectors, relay rack, power switchboard, mercury arc rectifier, two sets of type E-I storage battery and a four frequency ringing converter with duplicate vibrators and transformers.

The contract for this complete central office equipment, together with 900 subscribers' instruments, was awarded to the Stromberg-Carlson Telephone Manufacturing Company of Rochester, N. Y. The exchange equipment was also installed by the same firm.

"American" Sales Force Banquet

Following the custom of the American Electric Company of Chicago, the annual conference and get-together banquet of its sales force was held during the recent telephone convention in Chicago at the New Morrison Hotel. The American Electric Company believes that it has a most energetic bunch of order hustlers in the field —a splendid, compact organization.

A great deal of amusement was worked into the banquet by the initiation of new salesmen that have come into the organization during the year and the right and left bower at this year's initiation were "Jack" Speed and "Jack" Russell, both of whom claim they got a-plenty.

In spite of general business conditions, the sales of this company for 1914 were satisfactory and the prospects for 1915 are good. A number of new ideas have been worked out in the apparatus, closer touch with the trade maintained by the sales force, an increase in factory facilities and quicker shipments assured.

Among those present were L. G. LeBourveau, F. B. Boice, G. B. Pike, A. Strom, J. J. Speed, W T. Curtis, A. B. Ferdinand, J. A. Russell, R. E. Chambers, M. K. Cook, E. L. Brown, R. Leimann, L. E. Smith, E. Falk, R. Lipsey and J. E. Conway.

Stromberg-Carlson Exhibits

The Stromberg-Carlson Telephone Manufacturing Company of Rochester and Chicago displayed at the Minneapolis and Chicago conventions typical exhibits of its standard product.

The popular A-5629 magneto exchange switchboard equipped with No. 11 plug restoring drops, and No. 152 combination clearout drop, ringing, listening and ringback keys, with non-ring through attachment, attracted considerable attention by the discerning exchange operator. The extensively used 896 compact telephone was attractively shown, assembled and in parts, for critical examination.

The central energy men took great interest in the handsome 5620 mahogany p. b. x. board, the compact cordless board, and the display of central energy telephones—No. 951 business wall, No. 988 desk stands, No. 9 combination telephone and the new No. 1130 metal and No. 1126 oak residence telephones likewise shown, whole and in detail.

Interest was taken in the complete line of intercomphones, and the new specialties such as Telodetectives, wireless receivers, Call-a-phone signal system, Def-fones and test-sets.

Those who were anxious to see "what makes a Stromberg switchboard work" had an opportunity to examine each and every part of switchboard apparatus that enters into the construction of any type of switchboard from 10 lines to 18,000 lines capacity. These switchboard parts were mounted in trays, each part tagged and identified with its particular type of switchboard used.

Various new bulletins and souvenirs were distributed or forwarded on application.

F. K. Cannon, the northwestern representative, had charge of the Minneapolis exhibit. E. A. Reinke, sales manager from Rochester, N. Y.; A. M. Haubrich, Chicago manager, and L. E. La Fleur, sales correspondent of Chicago, were in attendance at both events.

Submarine Cables at Portsmouth, N. H.

The Simplex Wire & Cable Company of Boston has been awarded the contract to manufacture and lay about one mile of three conductor, cambric insulated, submarine cable for the Rockingham County Light & Power Company of Portsmouth, New Hampshire. The cable is to be laid across Great Bay, above Portsmouth, early in the spring and will form a part of the transmission line from the central station at Portsmouth, through the towns of Newington, Durham and Madbury to Dover where current is supplied for the Dover, Somersworth and Rochester Street Railway. At Durham a branch line supplies light and power to the New Hampshire College. Each conductor is to be No. 4 B. & S. stranded copper and will have varnished cambric insulation 7/32 inch thick. A jacket of varnished cambric 6/32 inch thick will be applied over the three insulated conductors after they are twisted together. The cable is to be protected by a lead sheath ⅛ inch thick and an armor of No. 6 B. W. G. galvanized steel wire, and will weigh about twelve pounds per foot. It will be sent from Boston to Portsmouth on a lighter, the gross shipping weight being about sixty-five thousand pounds. The T. A. Scott Company of Boston, marine contractors and wreckers, will supply the lighter and apparatus to be used by the Simplex Wire & Cable Company on this work.

Transcontinental Communication

Some interesting historical data in brief form is supplied by the Western Electric Company, which furnished all the equipment used in the transcontinental telephone line recently opened. The dates list as follows:

TRANSCONTINENTAL TRAVEL

1849—By stage coach, 5 months.
1859—New York to San Francisco by sailing vessel around Cape Horn, 3 months.
1869—By railway, 20 days.
1914—By steamship through the Panama Canal, 16 days.
1915—By railway, average time 90 hours; record 71 hours 27 minutes.
1915—By transcontinental telephone line, one-fifteenth of a second.

HISTORIC CELEBRATIONS

1756—First mail coach between New York and Philadelphia.
1807—Fulton's "Claremont" sails up Hudson River.
1825—Santa Fe trail developed.
1844—First telegraph message from Washington to Baltimore.
1858—First Atlantic cable successfully laid.
1869—Golden spike driven at completion of first transcontinental railway line.
1892—New York-Chicago telephone line opened.
1896—Marconi sends first long wireless message.
1911—New York-Denver telephone line opened.
1915—New York-San Francisco telephone line completed.

CEREMONIES ATTENDING THE OPENING

Dr. Alexander Graham Bell, the inventor of the telephone, was the first to talk over the line at the New York end. Mr. Thomas A. Watson, who was Dr. Bell's assistant when the telephone was invented, received the message at San Francisco and talked to Dr. Bell.

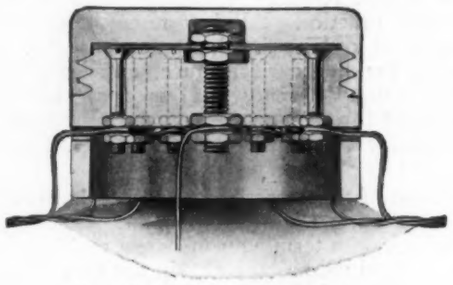
At his desk, at the White House, President Wilson talked with San Francisco. Mayor John Purroy Mitchel of New York exchanged greetings with Mayor James Rolph, Jr., of San Francisco, as did Mayor Curley of Boston.

Mr. Theodore N. Vail, President of the American Telephone and Telegraph Company, at Jekyll Island, off the coast of Florida, talked to San Francisco—a distance of 4,400 miles—the connection having been established through New York.

A large folder entitled, "The Transcontinental Voice Highway," issues from the advertising department of the Western Electric Company. It is interestingly illustrated with views along the line and historical subjects, as well as cuts of the Western Electric apparatus details that go to make up the "highway."

Cox Multiple Lightning Arrester

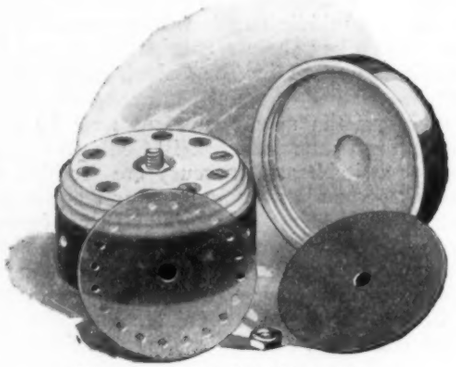
The Cox multiple lightning arrester was invented by C. E. Cox, manager of the Eaton Telephone Company, Eaton, Ohio. It derives its title from its ability to protect ten lines from one pole during any electrical storm. The instrument is made of a hard-burned glazed porcelain base upon which the porcelain cover screws down. The lines enter through holes in the base and fasten to screws, the flat heads of which are flush with the top of the base. On the base and over the screw heads is a mica disc with properly placed perforations for air gaps. Over the mica plate is placed a ground plate, held in place and



Cross Section of the Cox Arrester.

connected to ground by means of a center screw with a nut at the top.

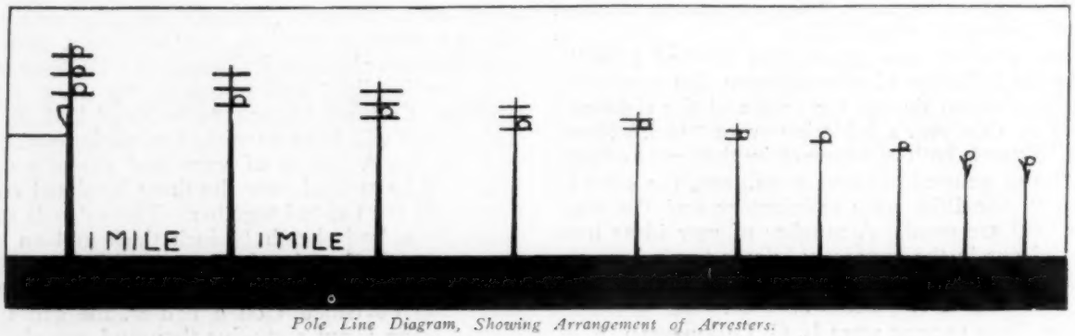
This simple and inexpensive arrester has been thoroughly tested by Mr. Cox, who has used them for over two years to protect the lines of his company with perfect success and satisfaction. The company has over 800 rural



Parts of the Cox Multiple Arrester.

telephones connected over lines from 5 to 15 miles in length, coming in over cable, and Mr. Cox claims his arrester affords perfect protection in these cases.

The two views of the arrester shown here give a very good idea of its construction, and the diagrammatic



Pole Line Diagram, Showing Arrangement of Arresters.

pole line shows the arrangement of the instrument on poles.

Registered at the Chicago Convention

Delegates and Visitors to the Eighteenth National Gathering

Adams, A. F., Kansas City, Mo.
Adams, Mrs. A. F., Kansas City, Mo.
Adsit, F. W., Minneapolis, Minn.
Aisthorpe, E. T., Cairo, Ill.
Allen, Harvey M., Portsmouth, Ohio.
Allen, Terry W., Jackson, Tenn.
Allen, E. D., Pendleton, Ind.
Allensworth, H. R., Columbus, Ohio.
Achatz, R. V., Lafayette, Ind.
Ames, George B., Tallahassee, Fla.
Anderson, B. J., Richmond, Ind.
Appleton, C. R., Mt. Vernon, Ohio.
Appleman, J. S., Albia, Iowa.
Arnold, E. O., Mt. Vernon, Ohio.
Arthur, Hubert F., Chicago.
Atkins, J. B., South Bend, Ind.
Augustine, R. W., Chicago.
Auxer, Fred P., Cleveland, Ohio.
Babcock, Garrison, Chicago.
Babbert, Charles H., Columbus, Ohio.
Bagge, G. F., Chicago.
Baker, B. F., LeRoy, Ill.
Baker, W. F., Kinsman, Ill.
Bakewell, Edward, Indianapolis, Ind.
Banks, Miss G., Aurora, Ill.
Barton, C. H., Grand Ledge, Mich.
Bartley, N. P., Chicago.
Barrett, J. T., Rochester, N. Y.
Barber, E. L., Aurora, Ill.
Barker, E. F., Chicago.
Ballinger, W. C., Akron, Ohio.
Baily, A. N. Y., Richmond, Ind.
Batt, W. L., Rensselaer, Ind.
Batte, B. H., St. Louis, Mo.
Beaton, M. J., Chicago.
Beam, Frank L., Mt. Vernon, Ohio.
Bean, A. G., Elyria, Ohio.
Bennett, Charles A., Kansas City, Mo.
Benoist, W. F., Chicago.
Bernhard, Frank H., Chicago.
Bergendahl, R., Chicago.
Berry, A. J., Marion, Ohio.
Berry, Loren M., Dayton, Ohio.
Berry, J. J., Abilene, Kans.
Bestor, D. L., Mazomanie, Wis.
Beverly, J. J., Aurora, Ill.
Beyland, S. A., Elyria, Ohio.
Birch, George F., Macy, Ind.
Bischoff, W. E., Chicago.
Blaha, Miss M., Chicago.
Blake, B. H., Louisville, Ky.
Block, Lynton T., St. Louis, Mo.
Blomeyer, E. C., Waco, Texas.
Boal, A. D., Chicago.
Bohn, F. E., Ft. Wayne, Ind.
Boice, F. B., Chicago.
Bomberger, I. H., Aurora, Ill.
Bonner, J., Chicago.
Bovard, J. K., Everett, Mass.
Bowden, A. H., Almond, Wis.
Bowling, C. M., Hoopeston, Ill.
Bowling, Mrs. C. M., Hoopeston, Ill.
Bowdel, F. A., Cerro Gordo, Ill.
Boynton, E. D., Pleasant Plains, Ill.
Boyd, C. D., Chicago.
Boze, W. S., Des Moines, Iowa.
Bradshaw, F. C., Chicago.
Breternitz, G. H., Batavia, Ill.
Brewer, W. R., Chicago.
Bridges, I. N., Mahomet, Ill.
Briggs, Glenn A., Chicago.
Bromley, Thomas, Jr., Muskegon, Mich.
Brown, Milton A., Lafayette, Ind.
Brown, Wm. R., Lafayette, Ind.
Brown, J. M., Joliet, Ill.
Brown, C. L., Abilene, Kans.
Brofield, R. H., Chicago.
Brown, Floyd R., Chicago.
Brown, H. A., Chicago.
Brown, F. C., Clintonville, Wis.
Brown, E. L., Evanston, Ill.
Bruner, J. F., Rensselaer, Ind.
Bruner, Frank, Rensselaer, Ind.
Bryce, H. W., Chicago.
Burns, P. C., Chicago.
Burr, Miss M. G., Chicago.
Cable, D. J., Lima, Ohio.
Cadwallader, Ira, West Lebanon, Ind.
Calderwood, Walker, Chicago.
Camp, George, Rushville, Ind.
Campbell, Harry, Plymouth, Ind.
Campbell, John A., Plymouth, Ind.
Campbell, W. Lee, Chicago.
Cannon, George X., Columbus, Ohio.
Cannon, F. K., Minneapolis, Minn.
Carr, Thomas E., Defiance, Ohio.
Cardwell, Frances, Chicago.
Carville, Mrs. F. E., Kankakee, Ill.
Carville, F. E., Kankakee.
Carter, A. J., Chicago.
Cassaday, O. F., Chicago.
Chambers, R. J., Louisville, Ky.
Chapman, F. S., Greensburg, Ind.
Clark, E. L., Hebron, Ind.
Clark, A. L., Hebron, Ind.
Clarke, A. B., Kansas City, Mo.
Clow, A. S., Plainfield, Ill.
Close, J. H., Topeka, Kans.
Close, Kenneth B., Millersburg, Ohio.
Codington, G. E., Auburn, Nebr.
Coffey, J. W., Indianapolis, Ind.
Collins, H. N., Grand Rapids, Mich.
Conover, A. B., Chicago.
Conlee, H. E., Chicago.
Cook, H. Roy, Chicago.
Cook, Frank B., Chicago.
Cook, W. L., Chicago.
Cook, C. E., Chicago.
Corwin, W., Lincoln, Ill.
Corwin, M. J., Chicago.
Coster, A. L., Hinckley, Ill.
Coulson, Fred, Topeka, Kans.
Cowing, E. L., Peotone, Ill.
Cox, C. E., Eaton, Ohio.
Cox, W. F., Eaton, Ohio.
Crandall, George H., Springfield, Ill.
Crawford, A. B., Rochester, N. Y.
Crawford, H. J., Wausau, Wis.
Crackel, Robert, Chicago.
Creel, T. Z., Macomb, Ill.
Cressey, T. A., Chicago.
Croswell, M. H., Milwaukee, Wis.
Crosby, S. W., Ashtabula, Ohio.
Curtis, W. N., Chicago.
Curtis, W. T., St. Joseph, Mo.
Curren, A. J., Elyria, Ohio.
Currier, H. D., Chicago.
Dagger, Francis, Toronto, Ont., Canada.
Daicey, Emer E., South Bend, Ind.
Daley, John H., Tampico, Ill.
Danner, J., LaGrange, Ill.
Davis, H. E., Kansas City, Mo.
Davis, Mrs. H. E., Kansas City, Mo.
Davis, J. H., Danville, Ill.
Davis, Frank A., Columbus, Ohio.
Davis, Karl B., Middletown, Ind.
Davis, Marion F., Wooster, Ohio.
Davis, George H., Rushville, Ind.
Davis, Harry B., Chicago.
Davenport, C. G., Windfall, Ind.
Dean, E. J., Waco, Texas.
Deady, George M., Bad Axe, Mich.
Dee, David G., Chicago.
Deering, Charles C., Des Moines, Iowa.
Deindoefer, Jr., J. A., Defiance, Ohio.
Dent, George C., Chicago.
Deutsch, F., Aurora, Ill.
Diggs, A. B., Winamac, Ill.
Dorland, R. O., La Porte, Ind.
Doty, E. W., Cleveland, Ohio.
Dow, E. R., Chicago.
Drier, E., Chicago.
Du Bois, F. G., Plainfield, Ill.
Dudley, H. B., Grand Rapids, Mich.
Dunlap, T. L., Springfield, Mo.
Duncan, J. A., Chicago.
Dutton, G. W., New Castle, Ky.
Dygert, A. B., Chicago.
Earle, J. B., Waco, Texas.
Eaton, George R., Chicago.
Edwards, S. R., Chicago.
Edwards, J. B., Chicago.
Eldridge, F. L., Chicago.
Eley, A., Des Plaines, Ill.
Ellis, W. E., Geneva, Ohio.
Ellwanger, J. F., Chicago.
Enochs, C. D., Minneapolis, Minn.
Enright, W. J., Kinsman, Ill.
Evans, M. B., Chicago.
Every, G. M., Grand Ledge, Mich.
Everett, George, Delta, Ohio.
Fargo, H. D., Chicago.
Faust, P., Auburn, Ill.
Fehrenbach, E. G., Kansas City, Mo.
Ferdinand, A. B., Chicago.
Fillmore, Albert E., Fairmont, Minn.
Fister, George H., Philadelphia, Pa.
Fish, E. C., Clifton, Ill.
Fischer, L. W., Chicago.
Fleming, C. E., Tama, Iowa.
Folsom, R. A., Dayton, Ohio.
Foote, L. R., Kansas City, Mo.
Fort, K. W., Chicago.
Fowler, W. H., Pella, Iowa.
Frantz, H. M., Chicago.
Fraser, W. C., Streator, Ill.
Frazee, O. F., Hollywood, Ill.
Frostenson, W. G., Chicago.
Fuller, D. E., Clyde, Ohio.
Fuller, W. H., Chicago.
Fuller, Geo. R., Rochester, N. Y.
Furlong, L. A., Minneapolis, Minn.
Furnas, V. E., Louisville, Ky.
Gallon, W. J., Sheboygan, Wis.
Garard, I. B., Dana, Ind.
Gary, Theodore, Macon, Mo.
Gary, H. S., Kansas City, Mo.
Garfield, James R., Cleveland, Ohio.
Gensel, Hugo S., Chicago.
Gilleland, R. T., Danville, Ill.
Gifford, L., Davison, Mich.
Gonsett, J. E., Chicago.
Good, Charles W., Ashland, Ohio.
Graffis, J. M., Chicago.
Graham, H. E., Cygnet, Ohio.
Graham, C. R., Oberlin, Ohio.
Graham, Adelbert, Canton, Ohio.
Grauel, C. M., Painesville, Ohio.
Grace, C. O., Columbus, Ohio.
Greene, H. S., Cleveland, Ohio.
Grier, N. F., Chicago.
Groh, B. C., Chicago.
Gruner, F. A., Rensselaer, Ind.
Gullion, T. J., Dixon, Ill.
Haase, A. L., TELEPHONE ENGINEER, Chicago.
Haeger, W. F., Chicago.
Haines, E. V., Indianapolis, Ind.

Hall, Roy W., Westfield, Ill.
Hall, A. S., Redfield, S. D.
Hall, Robert, Chicago.
Hamilton, W. C., Chicago.
Hamilton, C. L., Minneapolis, Minn.
Hamilton, Miss E. C., Chicago.
Hanna, E. H., Columbus, Ohio.
Hans, W. W., Laporte, Ind.
Harris, H. L., Elyria, Ohio.
Harbaugh, W. W., Sullivan, Mo.
Hardy, Miss C., Chicago.
Harrison, A. H., Chicago.
Harrison, R. W., Nashville, Tenn.
Harper, S. W., Pittsburgh, Pa.
Harbaugh, M. J., Sullivan, Mo.
Harris, S. S., Princeton, Ill.
Hartman, E. R., Joplin, Mo.
Haskins, Grace, Chicago.
Hasemeyer, F. C., Naperville, Ill.
Hastie, J. R., Chicago.
Haubrich, A. M., Chicago.
Hays, Charles A., Macon, Mo.
Heinemann, N., Wausau, Wis.
Heller, S. M., Louisville, Ky.
Helfenstein, W. L., Shamokin, Pa.
Hemphill, W. P., Kansas City, Mo.
Henss, L. C., Wayland, Iowa.
Hendricks, U., Pella, Iowa.
Herron, M. M., Millersburg, Ohio.
Hickman, C. L., Chicago.
Hill, Ed. O., Streator, Ill.
Hind, W. R., Des Moines, Iowa.
Hirsch, Gustav, Columbus, Ohio.
Hirsch, Seymour, Toledo, Ohio.
Hodgson, F. M., Plymouth, Ind.
Hogue, H. W., Indianapolis, Ind.
Holdoegel, P. C., Rockwell City, Iowa.
Holland, A. C., Chicago.
Hollander, Chas. E., Newark, Ohio.
Holmes, F. R., Kansas City, Mo.
Hooper, E. S., Crawford, Nebr.
Hosea, M. F., Indianapolis, Ind.
Houston, H. C., Warrensburg, Mo.
Howard, E. A., Wheeling, W. Va.
Hubert, W. A., Eaton, Ohio.
Hudson, J. A., Columbia, Mo.
Huffman, C. C., Chicago.
Hunter, N. G., Wabash, Ind.
Hunter, H. B., Wabash, Ind.
Hurd, E. C., Lincoln, Nebr.
Hurtz, L. E., Lincoln, Nebr.
Hyde, B. C., Kansas City, Mo.
Hyneman, L. F., Lexington, Ill.
Ide, Harry H., La Grange, Ill.
Ingram, A. B., Toronto, Ont., Canada.
Insley, F. B., Excelsior Springs, Mo.
Isam, S. M., Mitchell, Ind.
Jeffery, H. E., Aurora, Ill.
Jenks, Anna A., Chicago.
Jewett, Harry, Chicago.
Johnson, Roy H., Chicago.
Johnston, G. R., Columbus, Ohio.
Johnston, Gansey R., Columbus, Ohio.
Johnson, A. J., Chicago.
Johnson, W. W., Jefferson City, Mo.
Jones, Warner, Cleveland, Ohio.
Journey, W. R., Higginsville, Mo.
Joy, G. A., Elyria, Ohio.
Junge, O. C., Chicago.
Kandler, Robt. A., Chicago.
Kavanaugh, W. J., Kansas City, Mo.
Keith, A. E., Chicago.
Kelsey, J. C., Chicago.
Kellogg, James G., Chicago.
Kennedy, F. P., Madison, Wis.
Kennedy, R. R., Chicago.
Kent, L. N., Chicago.
Kepner, B. F., Genoa, Ill.
King, G. G., Youngstown, Ohio.
Klessak, Stanley C., Chicago.
Klinger, J. G., Brazil, Ind.
Klunder, S. E., Chicago.
Kneise, Arthur, Chicago.
Knipe, H. H., Olney, Ill.
Knowles, W., Sullivan, Ill.
Kohn, A. J., Genoa, Ill.
Koontz, Charles E., Bremen, Ind.
Kornbeck, W. H., Chicago.
Laning, H. B., Chicago.
Lamkin, J. C., Marseilles, Ill.
La Fleur, L. E., Chicago.
Larrabee, Ross, Kansas City, Mo.
Lawrence, E. G., Minneapolis, Minn.
Lawrence, A. S., Chicago.
Le Bourveau, L. G., Chicago.
Leich, O. M., Genoa, Ill.
Leinarg, H. O., Cleveland, Ohio.
Lenz, P. C., Jr., Chicago.
Lenz, J. M., Chicago.
Lewis, W. S., Cleveland, Ohio.
Lewis, S. M., Jackson, Tenn.
Lewis, C. W., Hetinger, N. D.
Lewis, E. C., Chicago.
Lidecker, F. A., Walkerton, Ind.
Light, F., Fairfield, Ia.
Lindas, H. E., Great Bend, Kans.
Lodge, W. F., Monticello, Ill.
Loudenslager, O. L., Le Mars, Iowa.
Lusk, M. W., Cleveland, Ohio.
MacKay, F. W., Toronto, Ont., Canada.
Madre, J. A., Melrose Park, Ill.
Mahan, C. A., Kansas City, Mo.
Mackie, D. B., Chicago.
Makibbon, R. J., Green Park, Pa.
Mannhardt, D. W., Washington, Iowa.
Manning, A. H., McLouth, Kans.
Mann, N. E., Macomb, Ill.
Manson, Ray H., Elyria, Ohio.
Martin, E. H., Webster City, Iowa.
Massman, C. F., Chicago.
Mattison, R. E., Lincoln, Nebr.
McAustin, F. H., Fairfield, Iowa.
McAnge, Jr., W. N., Corinth, Miss.
McCaig, H. T., Des Moines, Iowa.
McCrea, William, Greenfield, Ind.
McCord, E. F., Chicago.
McConnell, L. T., Chicago.
McCanne, W. Roy, Rochester, N. Y.
McClure, A. G., New York.
MacDuff, R. E., Chicago.
McDonald, R. E., Kansas City, Mo.
McFell, J., Chicago.
McGivern, A. J., Chicago.
McHenry, Houck, Jefferson City, Mo.
McIntyre, D. M., Toronto, Ont., Canada.
McMeal, H. B., Chicago.
McMeen, S. G., Columbus, Ohio.
McNutt, V. S., Genoa, Ill.
McQueen, Mrs. D. A., Morgan Park, Ill.
McVey, C. Y., Cleveland, Ohio.
McWayne, H. W., Rhinelander, Wis.
McWethy, H. E., Madison, Wis.
Medlar, L. R., Morrison, Ill.
Meinema, Thomas G., Chicago.
Mellot, W. T., Sullivan, Ind.
Mellot, W. T., Mrs. Sullivan, Ind.
Mercer, Jas. H., South Bend, Ind.
Merriman, B. H., Omaha, Nebr.
Methot, Clark H., Chicago.
Metheany, George H., Lima, Ohio.
Metzner, A. S., Jacksonville, Fla.
Meyers, E. F., Cleveland, Ohio.
Meyers, Orin, Chicago.
Mills, A. C., Chicago.
Miller, E. G., Crisman, Ind.
Miller, S. E., Danville, Ind.
Miller, Robert, Muncie, Ind.
Milburn, J. D., Dallas, Tex.
Mitchell, J. G., Chicago.
Mitchell, H. W., Chicago.
Mock, Ed J., Telephone Engineer, Chicago.
Montague, F. R., South Bend, Ind.
Moody, F. B., Columbus, Ohio.
Moore, J. M., Waterloo, Iowa.
Moore, P. J., Chicago.
Mooney, J. E., Grand Rapids, Mich.
Moore, W. L., Tallahassee, Fla.
Morris, L. B., Lafontaine, Ind.
Morse, A. C., Cleveland, Ohio.
Morrison, J. W., Rochester, N. Y.
Morrison, W. H., Ashtabula, Ohio.
Morier, L. E., Columbus, Ohio.
Moulder, B. M., Kansas City, Mo.
Mueller, G. E., Chicago.
Munn, Hayes, Tyner, Ind.
Murray, Tom, Chicago.
Myers, P. D., Lincoln, Ill.
Myers, C. J., Kansas City, Mo.
Myers, J. E., Dayton, Ohio.
Myers, George M., Rensselaer, Ind.
Navarre, J. Alex, Toledo, Ohio.
Neir, E. R., Chicago.
Nelson, C. L., Genoa, Ill.
Newburn, C. C., Chicago.
Newman, F. V., Grand Rapids, Mich.
Newberry, S. R., Ashtabula, Ohio.
Nickel, Henry W., Chicago.
Nielson, C. W., Chicago.
North, H. E., Chicago.
Norton, Elbert F., Chicago.
O'Connor, Wallace, Chicago.
O'Dell, H. C., Frankfort, Ill.
O'Neil, Mae C., Chicago.
Onbealt, S. S., Wilmington, Ohio.
Ogden, B. A., Wilmington, Ohio.
Overshiner, A. V., Elyria, Ohio.
Owens, Roy, Chicago.
Palmer, G. H., Columbus, Ohio.
Parker, LeRoy, Columbus, Ohio.
Parrett, F. R., Princeton, Ind.
Pardee, F. W., Chicago.
Parlett, Albert, Bristol, Tenn.
Parker, Frederick R., Chicago.
Patrick, Curtis, Oskaloosa, Kans.
Patterson, A. R., Streator, Ill.
Pearl, W. H., Indianapolis, Ind.
Peck, Jr., George W., Chicago.
Pedersen, A. S., Chicago.
Peel, Charles R., Chicago.
Pegrin, F. C., Clyde, Ohio.
Perigo, Frank W., Otterbein, Ind.
Peterson, F. H., Dows, Iowa.
Peterson, Miss L. M., Chicago.
Pettey, C. H., Kearney, Nebr.
Pietzcker, E. J., St. Louis, Mo.
Pieper, C. R., La Crosse, Wis.
Pitcher, Louis, Dixon, Ill.
Plaister, J. M., Fort Dodge, Iowa.
Plummer, H. E., Louisville, Ky.
Pogue, P. S., Louisville, Ky.
Pogue, William, Columbia City, Ind.
Polk, W. C., Kansas City, Mo.
Pratt, Edward I., Chicago.
Pratt, Warren, Kearney, Nebr.
Price, H. A., Bad Axe, Mich.
Quayle, Fred R., Chicago.
Queen, C. J., Columbus, Ohio.
Rader, F. A., Topeka, Kans.
Rae, James A., Sioux City, Iowa.
Ramsey, W. H., Auburn, Ill.
Randall, M. A., Joplin, Mo.
Rankin, R. R., Chicago.
Rebel, Paul, Chicago.
Redmond, M. W., Chicago.
Reid, A. C., Genoa, Ill.
Reinke, Eugene A., Rochester, N. Y.
Renwick, R. H., Walnut, Ill.
Reyer, W. C., Madison, Wis.
Reynolds, F. S., Rushville, Ind.
Rhodes, J. H., Wilmington, Ill.
Rhode, W. O., Aurora, Ill.
Richmond, N. S., Chicago.
Rickerson, F. H., Chicago.
Riley, E. J., Attica, Ind.
Risser, J. F., Des Moines, Iowa.
Ritterhoff, H. W., Kansas City, Mo.
Roberts, A. J., Kansas City, Mo.
Roberts, Miss H., Chicago.
Roberts, W. J., Kansas City, Mo.
Robinson, J. A., Kansas City, Mo.
Robson, W. H., Chicago.
Rodormer, George W., Chicago.
Roepke, Fred A., Fairmont, Minn.
Roller, Miss Hazel M., Polo, Ill.

Rotherfan, Mrs. H. B., Kansas City, Mo.
Rowe, H. A., Elkhart, Ind.
Ruehlmann, F. J., Chicago.
Runkel, F. H., Portage, Wis.
Russell, J. A., Chicago.
Russman, C., Lamoille, Ill.
Safford, J. W., Troy, Ohio.
St. John, L. C., Chicago.
Saunders, G., Grinnell, Iowa.
Savage, Manford, Champaign, Ill.
Sayers, R. C., Fairfield, Iowa.
Schafer, Fred B., TELEPHONE ENGINEER, Chicago.
Schlegel, George H., Chicago.
Schmucker, Miss Olive, Polo, Ill.
Schock, C. A., Sherman, Texas.
Schotta, Robt. R., Chicago.
Schulz, Miss C., Chicago.
Schweer, G. W., Windsor, Mo.
Scott, W. H., Detroit, Mich.
Scott, Henry W., Churubusco, Ind.
Scoville, George A., Elyria, Ohio.
Scoville, G. A., Elyria, Ohio.
Scruggs, W. B., Harrisonville, Mo.
Searl, T. A., Painesville, Ohio.
Seeley, Fred, Elwood, Ind.
Semple, C. B., Chicago.
Senska, C. E., Genoa, Ill.
Shafer, Henry, Chicago.
Shafer, Earl P., Indianapolis, Ind.
Shanahan, M., Chicago.
Shear, H. C., What Cheer, Iowa.
Shereft, H. H., Oskaloosa, Iowa.
Shoemaker, W. H., Columbus, Ohio.
Shoemaker, H. B., Toledo, Iowa.
Singler, Charles E., South Bend, Ind.
Sipperly, Lewis, Chicago.
Slingluff, W. H., Chicago.
Sloan, W. F., Madison, Wis.
Smith, Frank C., Chicago.
Smith, C. E., Morenci, Mich.
Smith, W. L., Neillsville, Wis.
Smythe, W. W., Jr., Chicago.
Snider, V. D., Kansas City, Mo.
Snyder, Thurman G., Columbus, Ohio.
Scott, W. H., Detroit, Mich.
Somer, Gladys, Aurora, Ill.
Sorensen, A. C., Aurora, Ill.
Speed, Charles J., Chicago.
Spencer, W. H., Chicago.
Stack, E., Chicago.
Stadermann, A. L., Terre Haute, Ind.
Stanton, L. W., Davenport, Iowa.
Staub, F. X., Ft. Wayne, Ind.
Stazak, M. B., Chicago.
Steinberger, F., Brooklyn, N. Y.
Steninger, J. A., Parker, S. D.
Stephens, J. F., Tracy, Ohio.
Stephens, H., Kansas City, Mo.
Sterrett, E. S., Henry, Ill.
Stewart, S. D., Chicago.
Stevens, Rollo R., Columbus, Ohio.
Stigberg, A. O., Chicago.
Stitt, W. S., Wabash, Ind.
Stoeffhaas, E. C., Chicago.
Stone, G. L., Greenville, Ill.
Stone, R. C., Muncie, Ind.
Stoops, Claude R., Nappanee, Ind.
Strickler, F. R., Franklin, Ind.
Surrell, A. W., Dayton, Ohio.
Swanson, F. E., Chicago.
Swoyer, C. A., Columbus, Ohio.
Taylor, N. S., Lexington, Ky.
Taylor, H. B., Columbus, Ohio.
Tewksbury, W. J., Chicago.
Thompson, W. J., Philadelphia, Pa.
Thomas, W. J., Shelbyville, Ky.
Thoreson, Miss R., Chicago.
Thorne, J. C., Fairfield, Iowa.
Thorpe, G. P., Wilmington, Ohio.
Thurman, V. E., Salem, Ind.
Todd, H. C., Maryville, Mo.
Tompkins, John F., Chicago.
Tomlinson, Sam, Plymouth, Ind.
Tomlinson, R. R., Plymouth, Ind.
Torrey, C. A., South Bend, Ind.
Townsend, M. E., Toledo, Ohio.
Tracy, O. H., Minneapolis, Minn.
Trautwein, F., Morrison, Ill.
Traver, L. E., Aurora, Ill.
Triebner, F. E., Toledo, Ohio.
Trimm, W. H., Ft. Dodge, Iowa.
Trumbull, L. Q., Fort Dodge, Iowa.
Trout, Ira, Acadia, Ind.
Umbach, M., Ft. Wayne, Ind.
Van Vleet, M. S., Rochester, N. Y.
Van Voorhies, F. J., Mt. Vernon, Ohio.
Van Sant, J. W., Washington, D. C.
Vaughan, S. O., Springfield, Ill.
Voss, J. B., Davenport, Iowa.
Wackerlin, George J., Chicago.
Wallace, H. E., Wabash, Ind.
Walsh, T. M., Chicago.
Ward, Adelbert V., Cleveland, Ohio.
Warner, W. H., Joplin, Mo.
Warner, Claude A., Morocco, Ind.
Warner, Eben D., Chadron, Nebr.
Wasson, B. F., Clinton, Ill.
Watkins, G., Newark, Ohio.
Watts, George, Knightstown, Ind.
Welsheimer, O. O., Columbus, Ohio.
Welland, F. H., Chicago.
Wells, E. N., Chicago.
Wesley, E. E., Columbus, Ohio.
Westburg, P. A., Chicago.
Wethy, H. M., Kansas City, Mo.
White, H. A., Kansas City, Mo.
Wickersham, R. C., Tipton, Ind.
Wilkins, Cooper, Cleveland, Ohio.
Wilkinson, J. B., Louisville, Ky.
Willey, T. H., Aurora, Ill.
Willey, Lena B., Aurora, Ill.
Williams, Pearl, Aurora, Ill.
Williams, F. E., South Bend, Ind.
Williams, F. H., Cleveland, Ohio.
Wimp, J. D., Shelbyville, Ky.
Wilson, F., Washington, Iowa.
Wilson, George O., Cedar Rapids, Iowa.
Wilson, W. S., Eminence, Ky.
Wilson, C. S., Chicago.
Wilson, J. O., Salina, Kans.
Witt, S. E., Chicago.
Wittemire, L. R., Mansfield, Ohio.
Wood, O. G., Streator, Ill.
Woodbury, Ben, Columbus, Ohio.
Woodruff, Paul H., TELEPHONE ENGINEER, Chicago.
Woods, Frank H., Lincoln, Nebr.
Woodworth, O. H., Arcola, Ill.
Woodward, E., Chicago.
Yerrick, A. A., Walkerton, Ind.
Young, F. A., Dowagiac, Mich.
Youmans, T. L., Osawatomie, Kans.
Zeluff, J. E., Toledo, Ohio.

Combined Public Utility Reports Are Issued

The Combined Public Utility Commission Reports are now being issued by the Public Utility Commission Reports Company, with offices in the Stock Exchange Building, Chicago, Illinois.

These combined reports fill a long-felt want in the public utility field. They give the wheat of utility regulation with the chaff removed and furnish the busy utility executive or attorney with the meat of the subject, from a legal, operating and financial standpoint. Yet each decision reported is a certified report and is given in full so that it may be used in practice before courts and commissions.

The direct method of indexing and digesting used by the publishers was very favorably received. There is no "Round Robin" indexing which carries the reader in a circle through a mass of conflicting decisions and comment and brings him back confused and perplexed. Each decision represents the final ruling on the question under consideration.

Through a co-operative agreement with the various commissions the publishers of these reports receive official copies of decisions and orders of the commissions affecting all public utilities. The decisions are then indexed by public utility experts. Each decision is closely analyzed and all of the salient points are indexed and cross indexed.

Army Officer Requests Loan of Telephones

The *Electrical Review* prints the following letter received from R. MacLeod, secretary, National Service League:

I have had the following letter from a major of the Royal Field Artillery, at present training new units at Farnborough:

As perhaps you are aware, this war consists of the employment of the three "t's," namely, "trenches," "tillery," and "telephones." We are very good at trenches; in time we shall make good artillerymen, but they will never make good telephonists unless they get telephones, of which I see no likelihood in the immediate future. Can you suggest any means by which we could be lent, or given, any telephones or buzzers, preferably of military design, to further the training of our men? They would be returned to the owners on receipt of the proper telephone equipment from the military authorities, but, as I have already stated, they have none at present to spare. I should be very grateful if you could suggest any means of obtaining these necessary instruments.

I rather feel if you could insert this letter in your correspondence columns as an appeal, there might be some of your readers who have unsalable, but useful, instruments which they could offer to lend, or give, under the circumstances. I shall be very glad to have any offers which you may receive.

Brevities of the Business

The Activities of the Whole Telephone Field Told in Short Paragraphs

PERSONAL NOTES

Harry L. Ford, formerly located in Hutchinson as traffic chief of the Missouri & Kansas Telephone Company, has been promoted and is now division traffic superintendent, with offices in Wichita.

S. H. Shutt, who has been district manager for the Texas Telephone Company at Waco, has been transferred to Temple. Mr. Shutt assumed his duties January 1.

Otto Carter of Lonoke is the new manager of the Southwestern Telephone & Telegraph Company at Leslie, Ark., succeeding Dan Parsons, resigned.

H. J. Baumann, manager of the Dundee exchange of the Chicago Telephone Company, has been appointed special agent for the company, his territory being the Elgin district, with adjacent exchanges in northern Illinois. Mr. Baumann will have headquarters in Dundee.

Philip H. Hopkins, who has been acting general manager of the Missouri and Kansas Telephone Company, with headquarters at Kansas City, Mo., has been promoted permanently to the office.

William Main, formerly superintendent of the Stroudsburg and Bushkill Telephone Company, Pa., has been elected manager of the Blue Mountain Telephone and Telegraph Company, succeeding C. H. Klander, resigned.

R. H. Coyne, sales representative of the Kellogg Company, Chicago, has been placed in charge as branch manager of the San Francisco office and territory. For the last four years Mr. Coyne has taken care of the Wisconsin trade for the company, making an excellent record and a great number of friends, will be glad to hear of his widened field of activity. R. H. Coyne has been with the Kellogg Company for twelve years, receiving a very thorough training in the construction and practicability of Kellogg apparatus in intended shop, office and operating experience. At the San Francisco office, which has recently moved to enlarged quarters at 86 Third Street, where a complete line is carried in stock, Mr. Coyne will have to assist him: L. H. Baldwin, C. F. and R. B. Fairly.

Mrs. Margaret Hyatt, after thirty-two years of service for the Chicago Telephone Company, Chicago, Ill., has resigned. Mrs. Hyatt was one of the best-known business women in the country, having worked herself up from operator to that of supervisor of service for the Chicago Telephone Company.

J. W. Southall has tendered his resignation as manager of the Quincy Telephone Company at Quincy, Fla., and will move to Cario, Ga., to take charge of his own plant.

Charles Ford, manager of the Garrettsville Telephone Company, Garrettsville, Ohio, recently underwent an operation for appendicitis an dis reported in a critical condition.

M. Nass, formerly manager for the Northwestern Telephone Company at Swanville, Minn., has been transferred to St. Cloud.

D. W. Strauss of Waco is now manager of the Independent telephone exchange at Waxahachie, Texas.

Joseph W. Sabel, formerly manager of the Preston, Idaho, exchange for the Mountain States Telephone and Telegraph Company, is now managing the exchange at Brigham City, Utah, succeeding W. E. Wibel, who has been transferred to Wyoming.

J. D. Gordon, plant supervisor of the Central District Telephone Company of Wheeling, W. Va., recently delivered an address on "Telephone Engineering" before the students of the University of Michigan.

At the end of the year 1914 L. W. Storror of the Pacific Telephone and Telegraph Company of San Francisco, Cal., retired from active service.

E. S. Randall, formerly manager of the Mountain States Telephone and Telegraph Company at Harley, Idaho, has been succeeded by J. Johnson.

C. E. Cruse of Gallatin has been made manager of the Cumberland Telephone Company at Tiponville, Tenn., succeeding Roy LeDuke.

Jacob J. Wolfe of Loysville, Pa., assistant manager of the Perry County Telephone and Telegraph Company, died at his home February 2, after a lingering illness.

C. Reed of Richmond is the new manager of the McHenry County Independent Telephone Company at McHenry, Ill.

C. B. Parrish of Earlington, Ky., has been made manager of the Cumberland Telephone and Telegraph Company at Hickman, succeeding W. T. White, who has been transferred to Paducah.

A. J. Adams has resigned his position as manager of the Farmers' Mutual Telephone Company at Clarinda, Iowa, and is succeeded by L. F. Evans of Brown Valley, Minn.

H. A. McNamara, formerly assistant to the division commercial superintendent of the Pacific Telephone and Telegraph Company at San Francisco, Cal., has been appointed district sales agent at Fresno.

On March 1 Warren Knapp will assume the management of the Flora Telephone Company at Flora, Ind.

J. B. Harwell of Little Rock, Ark., has succeeded W. M. Gordon as manager of the Southwestern Telephone Company in Ashdown. Mr. Gordon has been transferred to Clarksville, Texas.

E. C. Salisbury, for fourteen years in the employ of the Bell Telephone Company, several years of which was spent as manager of the Beatrice exchange at Nebraska, has accepted a position in the commercial department of the company at Minneapolis, Minn.

H. E. Patterson, who for ten years has been connected with the Pacific Telephone and Telegraph Company at Fresno, Cal., has been selected secretary of the Merchants' Association, to fill the vacancy caused by the resignation of Phil M. Harwood.

Elmer Nickerson, who has been manager of telephone offices at Beaver Dam, Juneau and Peoria, Wis., for several years past, has resigned his position.

E. K. Hall, vice-president of the New England Company, Boston, Mass., has been made a director and W. Cameron Forbes of the board of directors has been appointed a member of the executive committee.

Angus S. Hibbard has been elected a director of the Chicago Telephone Company to succeed the late A. A. Sprague.

W. B. Roberts, manager of the Terrell exchange at Texas for the Southwestern Telephone and Telegraph Company, has been transferred to Tyler. He is succeeded by H. P. King of Dallas, who is also district commercial manager of that company.

P. F. Ahlquist, manager of the Hastings, Neb., exchange for the Lincoln Telephone Company, has resigned and will shortly leave for Buh, Idaho.

Henry Harris, who has been connected with the Vicksburg, Miss., office of the Cumberland Telephone Company as assistant cashier, has been promoted to the position of cashier in the Clarksdale office.

S. B. Ridge has been appointed plant engineer on the engineering staff of the receivers for the Central Union Telephone Company under Kempster B. Miller. Mr. Ridge was formerly connected with the engineering and plant departments of the Central District and Printing Telegraph Company at Pittsburgh, Pa., on the staff of S. P. Grace.

A. B. Saurman, for the past twelve years Pacific Coast manager for the Standard Underground Cable Company, has been appointed southeastern manager of the company, succeeding the late T. E. Hughes, with headquarters in his native city, Philadelphia, Pa., and will return east in the early spring. He became associated with the company in Philadelphia in 1893 and after two and a half years in the construction department was transferred to the eastern sales department at New York City, leaving the position of assistant manager there in 1900, when he organized and was manager of the northeastern sales department with headquarters at Boston, until transferred to San Francisco as manager of the company's interests there in the fall of 1902. Mr. Saurman has, therefore, been connected with the Standard company for over twenty-one years and during the period of the greatest growth and development of this well known company. He has long been prominently identified with electrical interests upon the entire Pacific Coast and has co-operated in the working out of many of the important problems of the past decade in connection with electrical distribution in that territory.

John P. Bell, who will succeed A. B. Saurman as Pacific Coast manager of the Standard Underground Cable Company, entered the employ of the company at Pittsburgh, Pa., in 1896, where he has been located until transferred to the Pacific Coast.

For the past eight years Mr. Bell has been the assistant secretary and treasurer of the company. Both Mr. Saurman and Mr. Bell began their business experience with the Standard company in subordinate positions, and the fact that they owe their advancement to merit, rather than to favor, compliments them as well as the company, which thus evidences its belief in such a policy.

R. M. Hirst and Edward Kershner will continue to be associated with Mr. Saurman, as formerly with the late Mr. Hughes, in the Philadelphia office territory, with headquarters at Philadelphia. S. S. Warner in like manner remaining unchanged at the Atlanta sub-office.

NEWS FROM THE FIELD

ARKANSAS.

The Sheridan Telephone Company, Malvern, recently took over the lines and the Prattsville exchange owned by the Keesee Telephone Company. The purchase includes wires to Belfast and other towns.

A new company is being organized to purchase the Foreman telephone system of Ashdown. The new company is composed of the following officers: President, A. Goldsmith; vice-president, A. J. Kizer; secretary, John Hawkins; manager, A. B. Killian.

The Texarkana Telephone Company has taken over the local plant of the Southwestern Telephone Company at Texarkana.

CALIFORNIA.

The Pacific Telephone and Telegraph Company of Alameda is to commence at once the erection of the system on Bay Farm island.

A new telephone line is being constructed east from town by the Orosi Farms Company, to their townsite at the junction of the Santa Fe and El Monte way. It is being built of such materials and weight that it will serve the entire East Orosi colony for many years.

Articles of incorporation of the Sacramento Valley Telephone Company were filed with Secretary of State Frank C. Jordan, with J. F. Campbell and F. Luckenbell, both of Colusa, and J. R. Edwards of San Francisco as the incorporators. The company is formed for the purpose of constructing telephone and telegraph lines throughout the state of California and is capitalized for $500,000.

CANADA.

The cutting over of the old manual system of telephoning in Medicine Hat to the automatic system was accomplished January 1. For several months experts were at work installing the new system, which, together with a new building and equipment, cost $200,000.

The work of completing the Bell Telephone Company's new building on King street, St. Catherines, Ontario, is progresing rapidly and it is expected the building will be ready for occupancy about June 1.

ILLINOIS.

Rapid telephone service between Winnetka and Chicago has been established by the Chicago Telephone Company. The installation of the special equipment that makes this service possible was completed recently and the new service has been put in operation.

Taylor Ridge Switch Association, Taylor Ridge, $1,500; conduct telephone exchanges, Albert Hofer, Herman Hofer, Frank Curry.

At the annual meeting of the Plymouth Mutual Telephone Company, Plymouth, the following officers were elected: President, Fred L. Smith; secretary, Walter Huey; treasurer, S. M. Talbot, Jr.; director, Dr. W. O. Tuck.

The Mississippi Valley Telephone Company has installed a new switchboard in its office at Hamilton.

The annual business meeting of the Crescent Telephone Company was held January 2 at Hillsdale. The following officers and directors were elected for the coming year: President, George McMurphy, Hillsdale; vice-president, Leslie Hanna, Joslin; secretary, A. A. Matthews, Erie; treasurer, Ray Palmer, Hillsdale; directors, Andrew O'Brien, Hampton; George Wainwright, Zuma; Charles Walther, Port Byron; Fred Filmer, Coe; Seth Wilson, Canoe Creek; E. K. Thompson, Erie; John Pace, Erie; William James, Erie.

The members on No. 6 line at Salem held their annual meeting recently and elected the following officers for the year: President, Edward Farr; vice-president, Jesse Derry; secretary, Glenn McCormick; treasurer, Jesse Farr.

At the fourteenth annual meeting of the stockholders of the Automatic Electric Company held at the office of the company at Chicago January 12, the following directors were elected: Joseph Harris, John B. Russell, Alexander E. Keith, Albert G. Wheeler, Harmon A. Harris, Grant Pelton. At the directors' meeting the following officers were elected: Joseph Harris, president; John B. Russell, Harmon A. Harris, Grant Pelton, vice-presidents; Walter I. Patton, secretary; Joseph P. Hauck, treasurer. The regular quarterly dividend of 1 per cent was declared payable February 1.

At a meeting of the stockholders of the Rapatee and Maquon Farmers' Telephone Company held recently at Rapatee the following officers were elected for a period of three years: Manuel Foster, president; D. I. Foster, secretary and treasurer, and J. C. Hoxworth, director.

A meeting of the stockholders of the Maroa Telephone Company was held recently and J. P. Stoutenborough and George Gilbert were re-elected directors.

The annual meeting of the stockholders of the Central Illinois Independent Telephone Company was held in Rutland January 11.

New cables have been installed by the Central Union Telephone Company on the east side of Central Park, Sterling, all the wires having been removed.

The Bushnell and Good Hope Telephone Companies of Bushnell recently organized and elected the following officers: President, W. E. Hoffman; vice-president, Clem Paul; secretary and treasurer, Harry Lantz; trustees, O. M. McElvain and W. E. Spicer; committeemen, M. F. Mummert and G. W. Brewbaker.

INDIANA.

Members of the new board of directors of the Home Telephone and Telegraph Company of Fort Wayne named at the annual meeting of the stockholders on December 7 held a meeting recently and elected the following officers: William L. Moellering, president; John B. Reuss, vice-president; W. A. Bohn, secretary; Max B. Fisher, treasurer; Frank E. Bohn, assistant secretary.

At the annual meeting of the Terhune Telephone Company held on January 11 at Terhune the following officers were elected for the year: President, Howard Stephenson; vice-president, Thos. McVey; secretary, Luke Burgess; treasurer, W. M. Farwick. The directors are Henry Singleton, John Boyer, Frank Adams, Newton King and Samuel Stoops.

At a meeting of the stockholders of the Dunlap Mutual Telephone Company, Elkhart, January 8 the following officers were elected: President, Oliver Grosh; vice-president, George Rhodes; secretary, H. H. Garber; treasurer, L. C. Cripe. The officers and John Dunmire comprise the board of directors.

The Bell Telephone Company will improve its exchange at Kendallville in the early spring.

IOWA.

The Iowa Telephone Company has completed the installation of its new plant at Monticello. Everything connected with the old plant, also with the Jones County Telephone, which lately has become a part of the Iowa Telephone, was discarded, including all fixtures, wires and telephones. The lines have all been rebuilt and the business lines on First street have been laid in conduits. The new system is fully equipped and is up-to-date in every particular.

The Lincoln Mutual Telephone Company recently purchased the fifty 'phones and line belonging to the Creston Mutual Telephone Company betwen Greenfield and Orient.

The stockholders of the Botna Valley Farmers' and Merchants' Telephone Company of Oakland met at the Masonic hall and elected the following officers for the year: President, W. S. Jarrett; vice-president, W. O. Bain; director, J. N. Maguire; treasurer, W. W. McRory; secretary, Milton H. Parks.

The Bell telephone men are stringing wires on the new poles from Winterset to Patterson.

The Western Electric Telephone Company are about to erect a $150,000 building at Mason City.

At the annual meeting of the stockholders of the Mutual Telephone Company, Cincinnati, the following officers were elected for the new year: President, A. W. Carr; vice-president, J. M. Brown; secretary, Nancy Ellis; treasurer, John Browitt; directors, W. G. Bozwell, C. H. Myres, J. M. Hoover, A. Mitchel and P. S. Davis.

The stockholders of the Avery Mutual Telephone Company at Cuba held a meeting January 6, and besides the regular routine of business decided to put a new wire on No. 5 line and to purchase one hundred cedar poles for use on the line.

The Norwich Yorktown Telephone Company, Norwich,

held its annual meeting January 9 and the following officers were elected for the year: H. M. Bohrea, president; S. A. Bohrer, vice-president, and H. H. Handorf, secretary and treasurer.

At the annual meeting of the Independent Telephone Company of Council Bluffs, held January 11, the following officers and directors were re-elected: President, Gen. G. M. Dodge, Council Bluffs; vice-president, E. H. Merriam, Council Bluffs; secretary, C. D. Parmalee, Omaha; treasurer, T. G. Turner, Council Bluffs; auditor, W. A. Pixley, Omaha; counsel, C. G. Saunders, Council Bluffs; executive committee, C. E. Hall, G. H. Pratt and W. A. Pixley, all of Omaha.

The Bell Telephone Company of Drakeville has moved their telephone from the old postoffice building to the J. N. Woods residence.

The Sweetland Township Trunk Line Telephone Company of Muscatine held its annual meeting January 11. Those named as officers were: President, Harry Connor; secretary, C. K. Beatty; treasurer, Albert Cole; lineman, Jacob Gettert.

Howard Eddington of Paulina has purchased the controlling interest in the Sutherland Telephone Company at that place.

The Marne and Elkhorn Telephone Company of Elkhorn held their annual meeting January 11. Harold Johnson was elected secretary and manager. A. P. Hamsen, N. P. Hoegh, John F. Fredrickson, S. C. Pedersen, Geo. L. Jorgensen and W. E. Potts were elected as directors.

O. Teeters of Waterloo has purchased the interest of Stillwagon and Schaeffer in the Batavia Telephone Company. The lines are being repaired and new 'phones are being installed.

KANSAS.

The Mutual Telephone Company at Horton has been sold to A. J. Stevens for $27,000, who will lease it to the Northeastern Kansas Telephone Company. By this transfer the two companies will be operated under one system.

The Quaker Valley Telephone Company, Galena, met and re-elected the old officers: F. T. Satterthwaite, president; Levi Bowles, secretary, and Edgar Harvey, treasurer.

At the annual meeting of the Macksville Telephone Company held January 11, the following officers were elected: J. H. Wolf, president; F. N. Hamilton, secretary and treasurer.

Many men are now working on the reconstruction of the toll lines of the Missouri and Kansas Telephone Company through Ottawa. The entire system between Kansas City and Osage City will be reconstructed.

KENTUCKY.

At a meeting held Christmas morning at Heath, stockholders of the Heath Telephone Company elected the following officers: M. B. Tapp, president and general manager; George Alliston, secretary and treasurer;, with the following men as directors: A. W. Rickman, J. H. Massie, C. W. Corneal, G. H. Harting, J. R. Reeves.

Licking Valley Telephone Company, Sublett; capital, $114; incorporators, C. S. Patten, H. R. Cordell, Lark Arnett, etc.

Farmers' Line, Bowling Green Road Telephone Company, Glasgow; capital, $99; incorporators, L. E. Holman, J. M. Speck, J. F. Reed and G. W. Dorsey.

Poplar Creek Telephone Company, Siler; capital, $500; incorporators, Lee Rose, Thomas Peace and B. A. Lee.

LOUISIANA.

The Cumberland Telephone Company's exchange at Plaquemine was damaged by fire.

Through the influence of Barton Baird of the Cumberland Telephone Company of New Orleans, the leper colony on the Mississippi river in Aberville parish, has been connected by telephone with the outside world after seventeen years of isolation.

MICHIGAN.

The Blissfield Telephone Company held its annual meeting yesterday and the following officers were elected: President and secretary, Charles Frary; treasurer, W. C. Jipson; manager, Henry Ross; board of directors, C. Frary, W. C. Jipson and Henry Ross.

Beginning January 1, the Michigan State Telephone Company, Grand Rapids, has announced a change in its collection system and hereafter will demand telephone rentals monthly instead of quarterly in advance.

Nearly one thousand Jackson county rural and village telephone users, patrons of independent telephone lines, are now connected with the Bell telephone system.

Caro business and professional men are being solicited by a committee of the Business Men's Association with a petition, signers of which pledge themselves to use only one telephone.

Within a short time the plans will be worked out for the taking over of the Southern Michigan Telephone Company's lines, exchanges and telephones by the Michigan State Telephone Company in Hillsdale and Lenawee counties.

The West Antrim Telephone Company of Morrice held its annual meeting January 9 and elected the following officers for the year: President, Edward Dippy; vice-president, Fred Brown; secretary, James Cunningham; treasurer, A. L. Beard; auditor, Wing Waters; trustees, Volney Alling and Frank Tyrrell.

After a suspension of several months, the Fayette Rural Telephone Company of Janesville has been compelled to resume connection with the privately maanged central office at Reading. This resumption of exchange is due to a recent decision of the State Railroad Commission, which compels the local company to exchange with Reading on a pay basis.

Farmers of Hancock county are making an effort to have a telephone system constructed in their locality.

At a meeting of the Valley Home Telephone Company directors in the general offices in Saginaw, officers were elected and four of the directors tendered their resignations from the board. The four are H. R. Martini, Sebewaing; C. B. Curtis, O. J. Porteus and J. C. McCabe, Bay City, the last named having been president of the company for the past three years. Following are the new directors: President, Clyde O. Trask; vice-president, Henry R. Martini; secretary and treasurer; James P. Gibbs; general manager, W. B. Serviss. Wm. F. Hemmeter, James C. McCabe and C. E. Lown were elected to the executive committee.

MINNESOTA.

Installation of the automatic telephone system in the Twin Cities will be begun February 1 by the Tri-State Telephone and Telegraph Company. Contracts call for the completion of the installation within eighteen months. This announcement was made by W. S. Williams, manager of St. Paul exchange.

The Mesaba Telephone Company will build a $20,000 central building at 315 Washington street, Hibbing, this winter, according to F. A. Day, manager. The building will be 55 by 45 feet and fireproof. Every modern appliance for a telephone building will be added, including an entire new equipment of switchboards.

The Tri-State and Blue Earth Valley Telephone exchanges at Wells have consolidated.

Work on stringing cables at Alice and Mahoning was started recently by the Mesaba Telephone Company. At Alice all the telephone lines are being torn down and are replaced by cables. Nearly three thousand feet will be strung in that suburb. At the Mahoning location a half mile of cables will replace old wires.

The Northwestern Telephone Company has installed a new cable in their exchange at Waterville.

MISSOURI.

At the annual meeting of the Sheridan Mutual Telephone Company of Grant City held January 13 the following were elected directors: A. A. Cook, J. B. Turner, C. P. Dowis, C. A. Scott and T. B. Stoner. The board organized by electing Judge J. B. Turner president and A. A. Cook secretary and treasurer.

At the annual meeting of the Consolidated Telephone Company of Skidmore, held January 12, the following officers were elected for the year 1915: W. J. Hitchcock, president; Wm. Taylor, vice-president, and R. A. Walker, manager.

The Andrew County Mutual Telephone Company of Savannah was recently damaged by fire. The loss is estimated at $2,000.

The stockholders of the King City Telephone Exchange Company held their annual meeting January 5. The following members were elected as the executive board for the ensuing year: Geo. Ward, John Flood, James Snapp, Wm. Cole, Jacob Levy and James Millan.

At the annual meeting of the Barnard Telephone Exchange at Maryville, held January 13, it was proposed to add new toll lines to Arkoe, Bolckow and Graham. The following officers were elected for the coming year: President, P. R. Melvin; vice-president, Henry Stalling; general manager, William Miller; secretary, F. H. Badger, treasurer, Geo. Cole.